

STRUCTURE : SILICON MONOLITHIC INTEGRATED CIRCUIT  
 FUNCTION : EARTH LEAKAGE CURRENT DETECTOR  
 PRODUCT : BD9582F/N(SOP/SIP)  
 FEATURES : •SOP8/SIP8 Package  
               •Good temperature characteristics of input sensitivity current  
               •Wide operating temperature range( $T_a = -20 \sim 95^{\circ}\text{C}$ )

#### ○ABSOLUTE MAXIMUM RATINGS( $T_a = 25^{\circ}\text{C}$ )

| Parameter                    | Symbol            | Rating                           | Unit               | Condition      |
|------------------------------|-------------------|----------------------------------|--------------------|----------------|
| Supply current (*3)          | $I_s$             | 8                                | mA                 |                |
| VR-IN current                | $I_{VR-IN}$       | $\pm 250$                        | mA                 | Between IN-VR  |
| VR pin current               | $I_{VR}$          | 30                               | mA                 | Between VR-GND |
| IN terminal current          | $I_{IN}$          | 30                               | mA                 | Between IN-GND |
| SC terminal current          | $I_{SC}$          | 5                                | mA                 |                |
| SC/OD/NR/OS terminal voltage | $V_{OD/SC/NR/OS}$ | 8                                | V                  |                |
| Power dissipation            | $P_d$             | 0.68 (SOP8 *1)<br>1.12 (SIP8 *2) | W                  |                |
| Storage temperature          | $T_{stg}$         | $-55 \sim 150$                   | $^{\circ}\text{C}$ |                |

•This IC is not designed for protection against radioactive rays.

(\*1) To use at temperature above  $T_a = 25^{\circ}\text{C}$  reduce  $5.5[\text{mW}]/^{\circ}\text{C}$ . Mounted on a glass epoxy PCB (70[mm] × 70[mm] × 1.6[mm])

(\*2) To use at temperature above  $T_a = 25^{\circ}\text{C}$  reduce  $9.0[\text{mW}]/^{\circ}\text{C}$ .  $P_d$  is a value in the package unit.

(\*3) The power-supply voltage is limited by the internal clamping circuit.

#### ○RECOMMENDED OPERATING CONDITIONS

| Parameter                                | Symbol    | Limit         |      |      | Unit               |
|------------------------------------------|-----------|---------------|------|------|--------------------|
|                                          |           | Min.          | Typ. | Max. |                    |
| Supply voltage                           | $V_s$     | 12            | —    | 22   | V                  |
| Operating temperature                    | $T_{opr}$ | $-20 \sim 95$ |      |      | $^{\circ}\text{C}$ |
| External capacitor between $V_s$ and GND | $C_{VS}$  | 1             | —    | —    | $\mu\text{F}$      |
| External capacitor between $O_s$ and GND | $C_{OS}$  | —             | —    | 1    | $\mu\text{F}$      |

#### Status of this document

The Japanese version of this document is the formal specification.

A customer may use this translation version only for a reference to help reading the formal version.

If there are any differences in translation version of this document formal version takes priority.

#### Application example

•ROHM cannot provide adequate confirmation of patents.

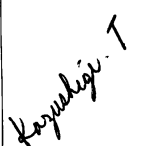
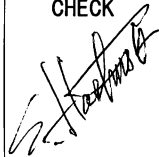
•The product described in this specification is designed to be used with ordinary electronic equipment or devices (such as audio-visual equipment, office-automation equipment, communications devices, electrical appliances, and electronic toys).

Should you intend to use this product with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

•ROHM assumes no responsibility for use of any circuits described herein, conveys no license under any patent or other right, and makes no representations that the circuits are free from patent infringement.

•If change is made to the constant of an external circuit, allow a sufficient margin due to variations of the characteristics of the products and external components, including transient characteristics, as well as static characteristics.

•The application examples, their constants, and other types of information contained herein are applicable only when the products are used in accordance with standard methods. Therefore, if mass production is intended, sufficient consideration to external conditions must be made.

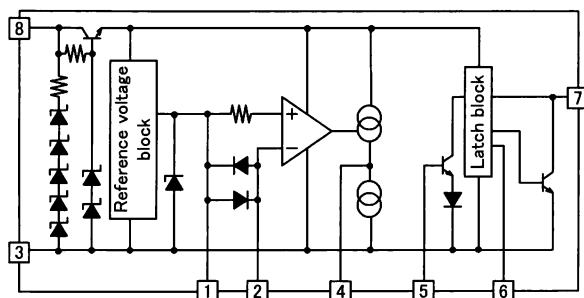
|                                                                                               |                                                                                              |                                                                                                 |                    |                                            |
|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------|--------------------------------------------|
| DESIGN<br> | CHECK<br> | APPROVAL<br> | DATE : Dec./8/2009 | SPECIFICATION No. : TSZ02201-BD9582F/N-1-2 |
|                                                                                               |                                                                                              |                                                                                                 | REV. A             | <b>ROHM Co., Ltd.</b>                      |

**OELECTRICAL CHARACTERISTICS**(unless otherwise specified,  $V_S=12V$ ,  $GND=0V$ ,  $T_a=25^\circ C$ )

| Parameter                                 | Symbol     | Condition                                      | Temp    | Limit          |                |                 | Unit          | Test circuit |
|-------------------------------------------|------------|------------------------------------------------|---------|----------------|----------------|-----------------|---------------|--------------|
|                                           |            |                                                |         | Min.           | Typ.           | Max.            |               |              |
| Supply current                            | $I_{S1}$   | $V_R-V_I=30mV$                                 | -20     | -              | -              | 520             | $\mu A$       | 1            |
|                                           |            |                                                | 25      | -              | 330            | 500             |               |              |
|                                           |            |                                                | 95      | -              | -              | 460             |               |              |
| Trip voltage                              | $V_T$      | $V_T=V_R-V_I$                                  | -20~+95 | 4.92<br>(3.48) | 7.50<br>(5.30) | 11.06<br>(7.82) | mV<br>(mVrms) | 2            |
| OD source current                         | $I_{ODS0}$ | $V_R-V_I=30mV$ ,<br>$V_{OD}=1.2V$              | 25      | -27.2          | -20.6          | -14.0           | $\mu A$       | 3            |
| OD sink current                           | $I_{ODS1}$ | $V_{OD}=0.8V$ , $V_R-V_I=0mV$                  | 25      | 16.7           | 26.0           | 35.3            | $\mu A$       | 4            |
| OS source current                         | $I_{OSS0}$ | $V_{SC}=2.0V$<br>$V_{OS}=0.8V$                 | -20     | -200           | -              | -               | $\mu A$       | 5            |
|                                           |            |                                                | 25      | -100           | -              | -               |               |              |
|                                           |            |                                                | 95      | -75            | -              | -               |               |              |
| OS sink current                           | $I_{OSS1}$ | $V_{SC}=0.2V$ , $V_{OS}=0.2V$                  | -20~+95 | 200            | -              | -               | $\mu A$       | 5            |
| Sc ON voltage                             | $V_{SCON}$ |                                                | 25      | 1.00           | 1.24           | 1.48            | V             | 6            |
| Input clamp voltage                       | $V_{IC}$   | $I_{IC}=20mA$                                  | -20~+95 | 4.3            | 5.5            | 6.7             | V             | 7            |
| Differential input clamp voltage          | $V_{IDC}$  | $I_{IDC}=100mA$                                | -20~+95 | 0.6            | 1.0            | 1.4             | V             | 8            |
| Maximum current voltage                   | $V_{SM}$   | $I_{SM}=7mA$                                   | 25      | 26             | 29             | 32              | V             | 9            |
| Supply current2 (*1)                      | $I_{OS2}$  | $V_R-V_I=30mV$ , $V_{SC}=2V$<br>$I_S=900\mu A$ | -20~+95 | -100           | -              | -               | $\mu A$       | 10           |
| Latch circuit is off-state supply voltage | $V_{SOFF}$ |                                                | 25      | 2.7            | 3.7            | 4.7             | V             | 11           |
| Operating time (*2)                       | $t_{ON}$   | $V_R-V_I=0.3V$                                 | 25      | 1.8            | 2.9            | 4.0             | ms            | 12           |

(\*1) Supply current2 means the output current value that can be secured when the decided power supply current ( $I_S=900\mu A$ ) is given.

(\*2) Operating time means the time applying fixed input to reaching to 0.8V by the output voltage in 0.047  $\mu F$  between  $O_D$  ( $O_S$ ) and GND.

**OBLOCK DIAGRAM**

**OPIN DESCRIPTION**

| No. | Symbol | Function                               |
|-----|--------|----------------------------------------|
| 1   | $V_R$  | + Input terminal                       |
| 2   | IN     | - Input terminal                       |
| 3   | GND    | Substrate ground                       |
| 4   | $O_D$  | Differential amplifier Output terminal |
| 5   | $S_C$  | Input terminal of latch circuit        |
| 6   | $N_R$  | Terminal for noise absorption          |
| 7   | $O_S$  | Output terminal                        |
| 8   | $V_S$  | Power supply terminal                  |

## OPHYSICAL DIMENSION

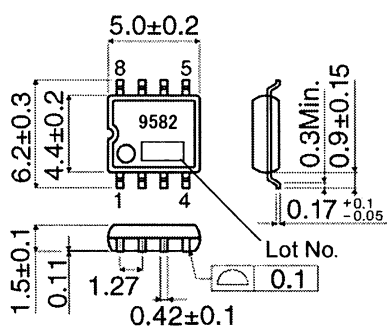


Fig.1 SOP8

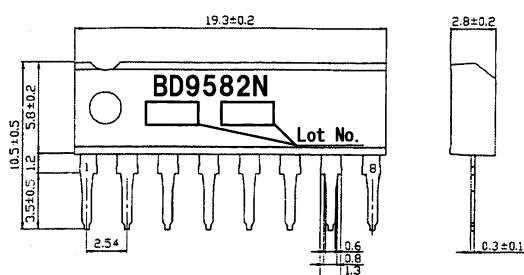
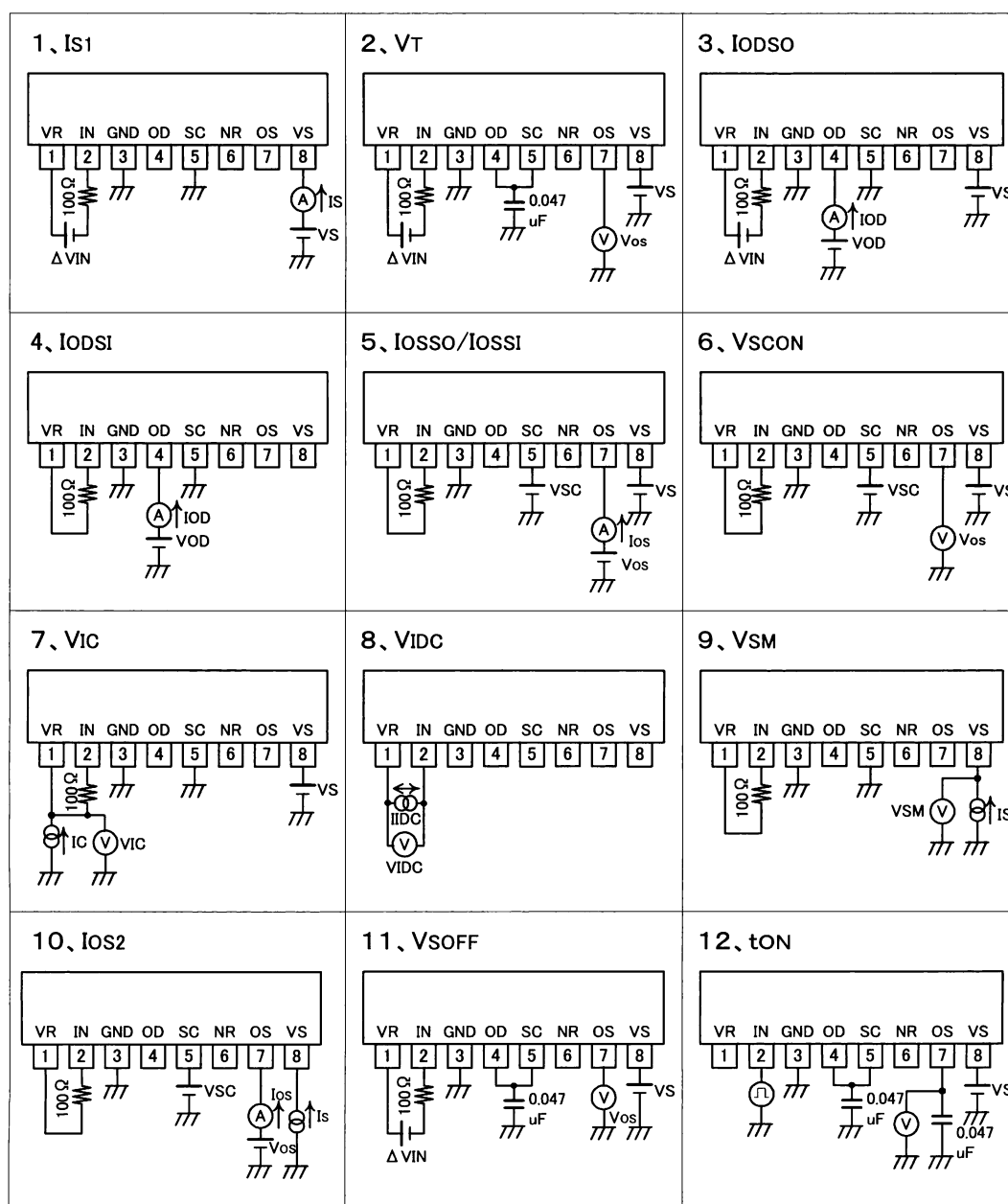
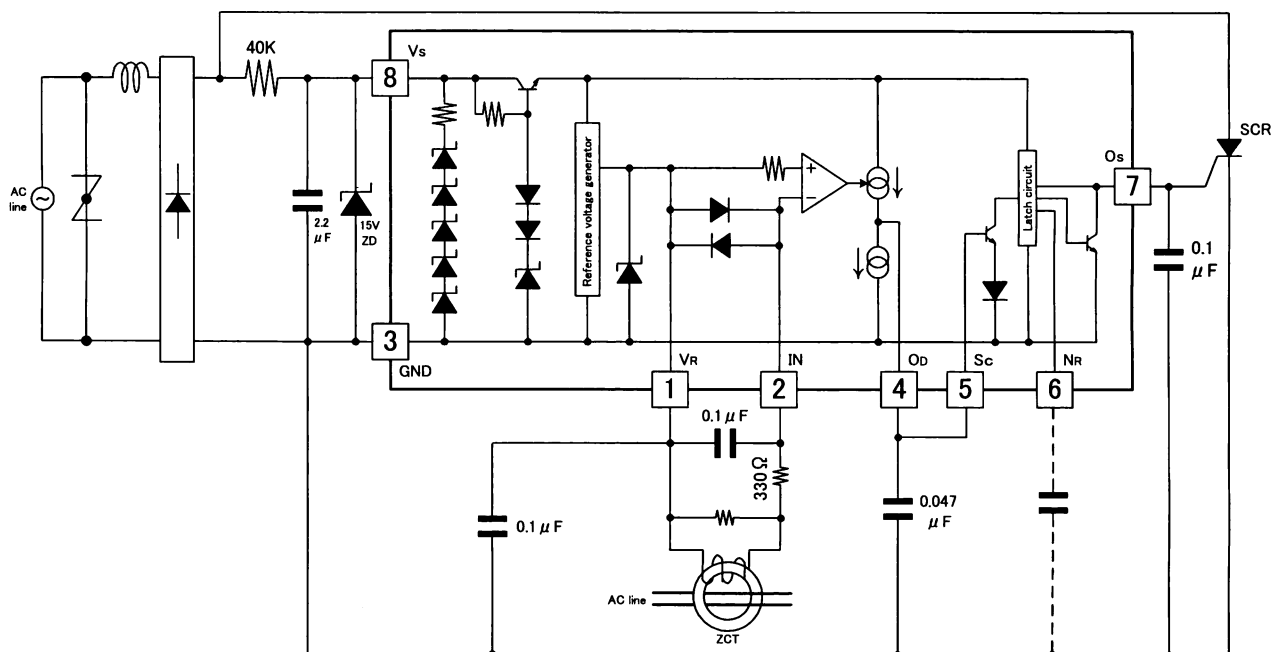


Fig.2 SIP8

## OTEST CIRCUIT



# APPLICATION EXAMPLE



# NOTICE

## ①Absolute maximum ratings

Absolute maximum ratings are the values which indicate the limits, within which the given voltage range can be safely charged to the terminal. However, it does not guarantee the circuit operation.

## ②Power dissipation(Pd)

If the IC is used under excessive power dissipation. An increase in the chip temperature will cause deterioration of the radical characteristics of IC. For example, reduction of current capability. Take consideration of the effective power dissipation and thermal design with a sufficient margin. Pd is reference to the provided power dissipation curve.

## ③Using under strong electromagnetic field

Be careful when using the IC under strong electromagnetic field because it may malfunction.

## ④Usage of IC

When stress is applied to the IC through warp of the printed circuit board, The characteristics may fluctuate due to the piezo effect. Be careful of the warp of the printed circuit board.

## ⑤Testing IC on the set board

When testing IC on the set board, in cases where the capacitor is connected to the low impedance, make sure to discharge per fabrication because there is a possibility that IC may be damaged by stress.

When removing IC from the set board, it is essential to cut supply voltage.

As a countermeasure against the static electricity, observe proper grounding during fabrication process and take due care when carrying and storage it.

## ⑥Power supply terminal and Output terminal

The power supply terminal and the output terminal are the next.

There is a possibility to destruction when this terminal is short-circuited.