

**SH 248 High Sensitivity CMOS Micropower Hall Switch**

SH248 includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, and a short circuit protected open-drain output. Advanced CMOS wafer fabrication processing is used to take advantage of low-voltage requirements, component matching, very low input-offset errors, and small component geometries.

**FEATURES**

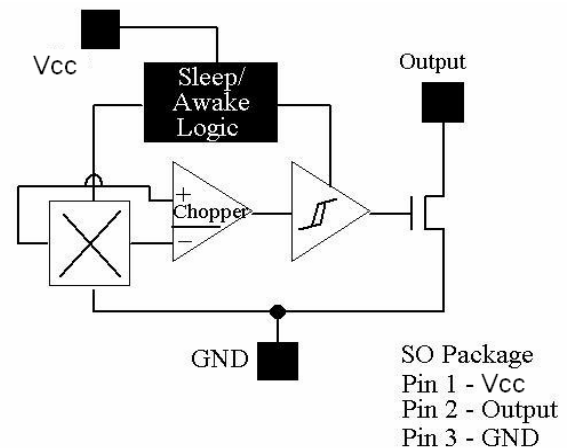
- CMOS Hall IC Technology
- Solid-State Reliability much better than reed switch
- Micro power consumption for battery-powered applications
- Omni polar output switches with absolute value of North or South pole from magnet
- High Sensitivity for reed switch replacement

**TYPICAL APPLICATION**

- Solid state switch
- Handheld Wireless Handset Awake Switch ( Flip Cell/PHS Phone/Note Book/Flip Video Set)
- Lid close sensor for battery powered devices
- Magnet proximity sensor for reed switch replacement in low duty cycle applications

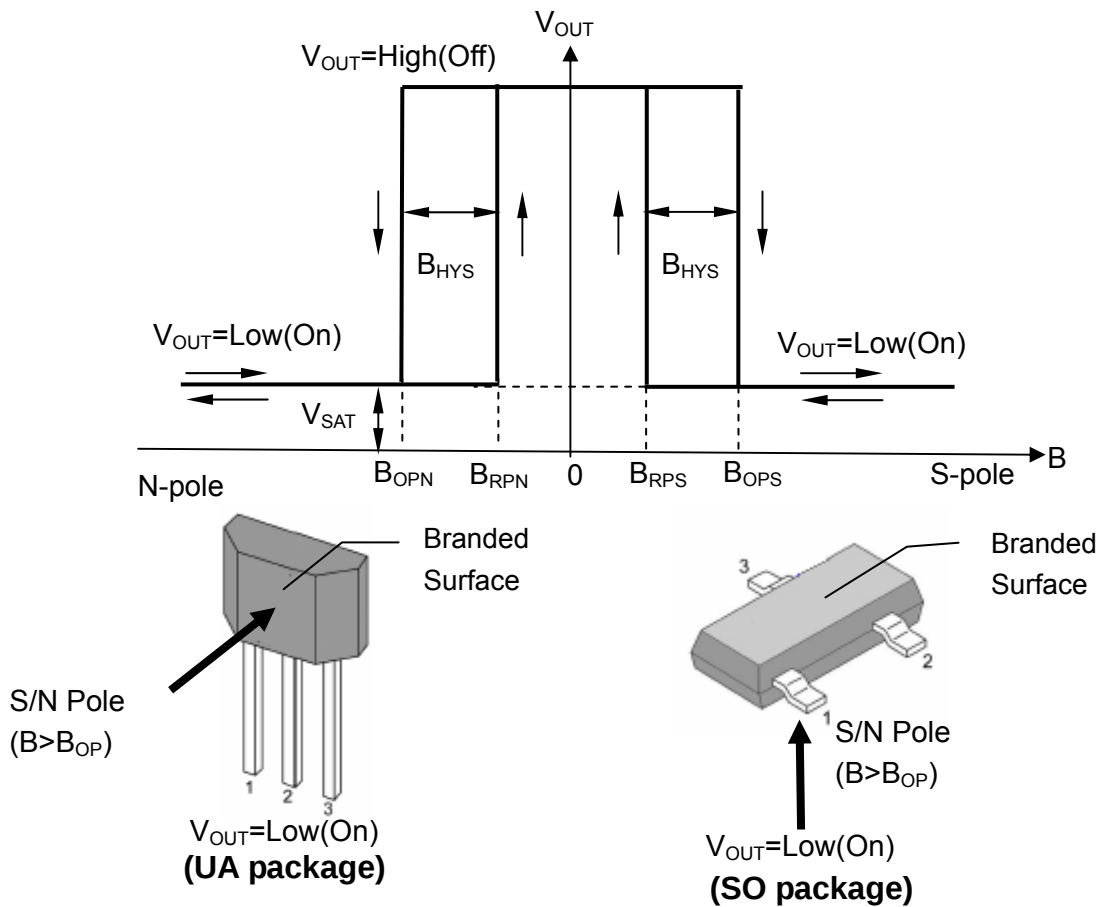
**ABSOLUTE MAXIMUM RATINGS** At ( $T_A=25^{\circ}\text{C}$ )

| Parameter                         | Symbol    | Value |     | Unit               |
|-----------------------------------|-----------|-------|-----|--------------------|
|                                   |           | Min   | Max |                    |
| Supply Voltage                    | $V_{CC}$  | 2.5   | 3.5 | V                  |
| Output Current                    | $I_{OUT}$ | -     | 1   | mA                 |
| Output Voltage                    | $V_{OUT}$ | -0.3  | 3.5 | V                  |
| Operating Temperature Range ( E ) | $T_A$     | -40   | 85  | $^{\circ}\text{C}$ |
| Storage Temperature Range         | $T_S$     | -55   | 150 | $^{\circ}\text{C}$ |

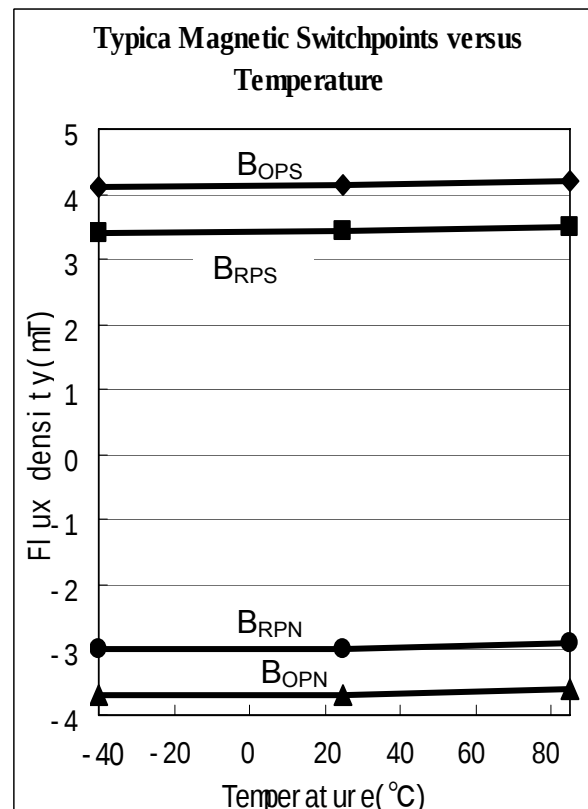
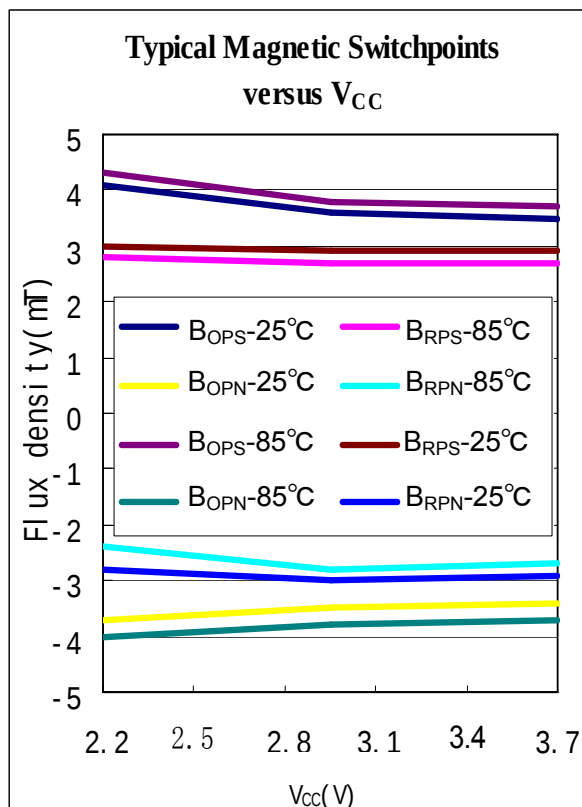
**FUNCTIONAL BLOCK DIAGRAM****SH248 ELECTRICAL & MAGNETIC CHARACTERISTICS** (At  $T_A=25^{\circ}\text{C}$ ,  $V_{CC}=3\text{V}$ )

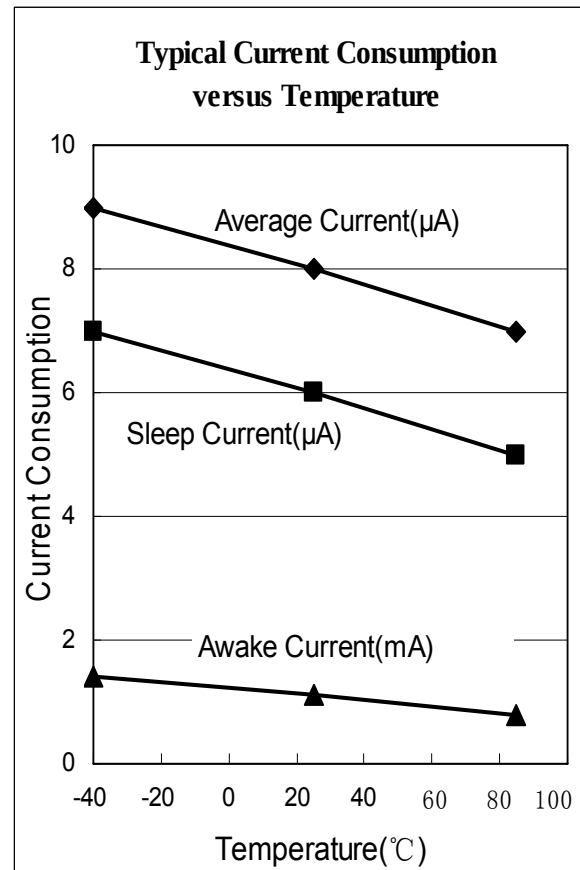
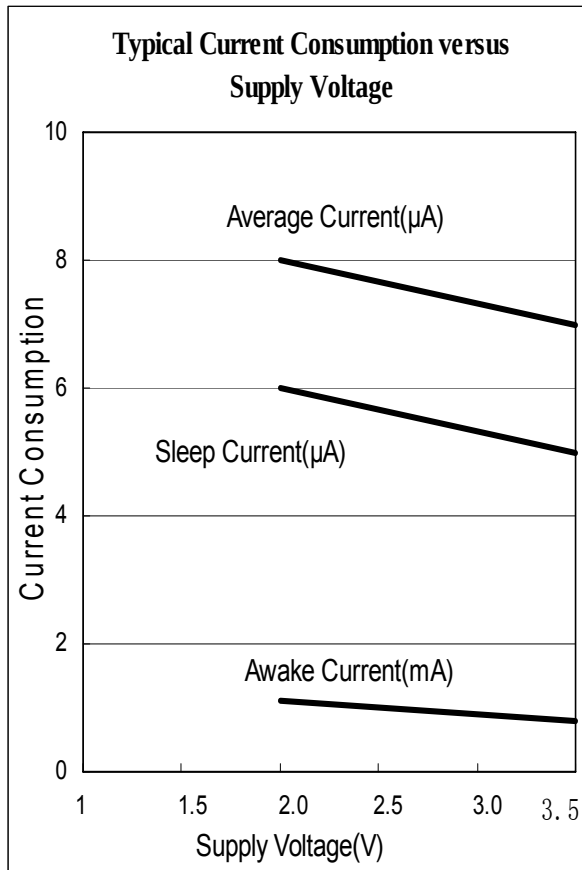
| Parameter                 | Test Condition                      | Symbol    | Value |       |      | Unit          |
|---------------------------|-------------------------------------|-----------|-------|-------|------|---------------|
|                           |                                     |           | Min   | Typ   | Max  |               |
| Supply Voltage            |                                     | $V_{CC}$  | 2.5   | -     | 3.5  | V             |
| Output Saturation Voltage | $I_{OUT}=1\text{mA}$ , $B > B_{OP}$ | $V_{SAT}$ | -     | -     | 0.4  | V             |
| Output Leakage Current    | $V_{OUT}=3\text{V}$ , $B < B_{RP}$  | $I_{OFF}$ |       | < 0.1 | 10   | $\mu\text{A}$ |
| Supply Current            | $B < B_{RP}$                        | $I_{CC}$  | -     | 8     | -    | $\mu\text{A}$ |
| Operate Point             |                                     | $B_{OPS}$ | -     | -     | 6    | mT            |
|                           |                                     | $B_{OPN}$ | -6    |       |      | mT            |
| Release Point             |                                     | $B_{RPS}$ | 0.5   | -     | -    | mT            |
|                           |                                     | $B_{RPN}$ |       |       | -0.5 | mT            |
| Hysteresis                |                                     | $B_{HYS}$ | -     | 0.7   | -    | mT            |
| Awake mode time           |                                     | $t_{aw}$  | -     | 175   | -    | $\mu\text{s}$ |
| Sleep mode time           |                                     | $t_{sl}$  | -     |       | 70   | mS            |

# MAGNETIC-ELECTRICAL TRANSFER CHARACTERISTICS

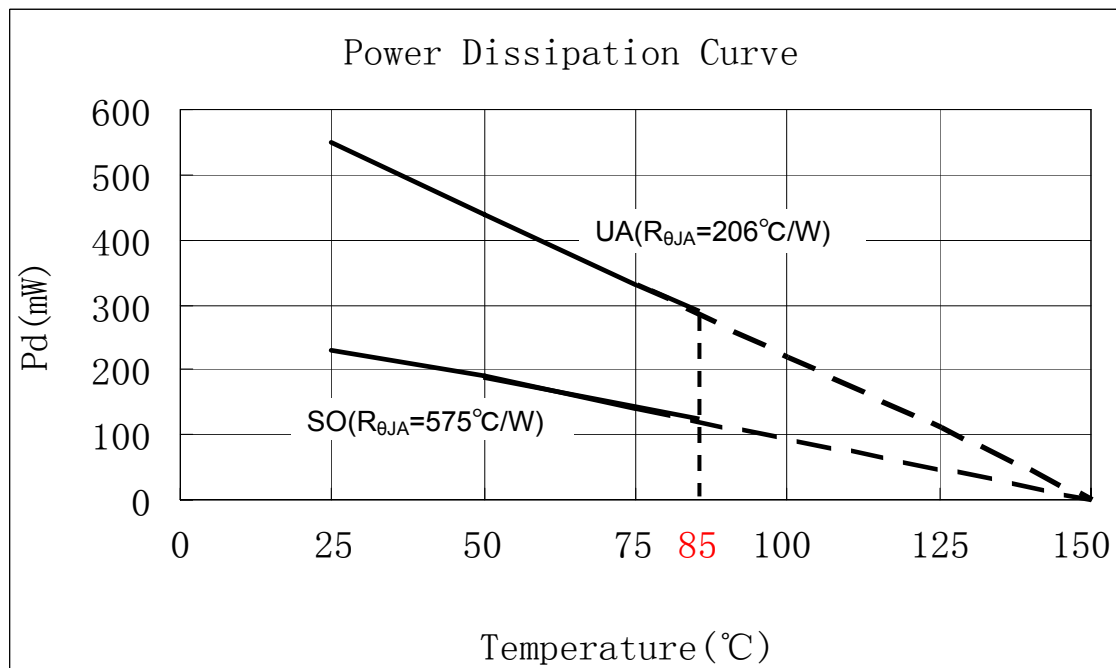


## PERFORMANCE GRAPHS





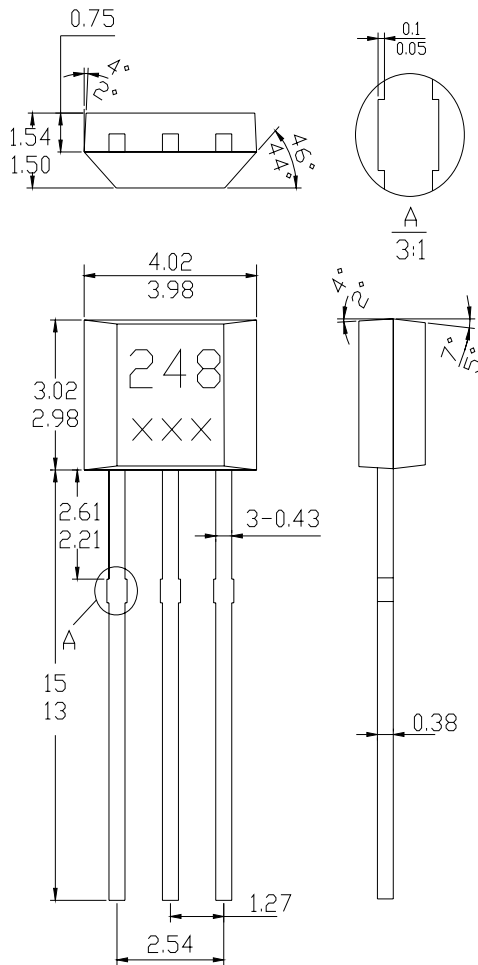
### POWER DISSIPATION VERSUS TEMPERATURE



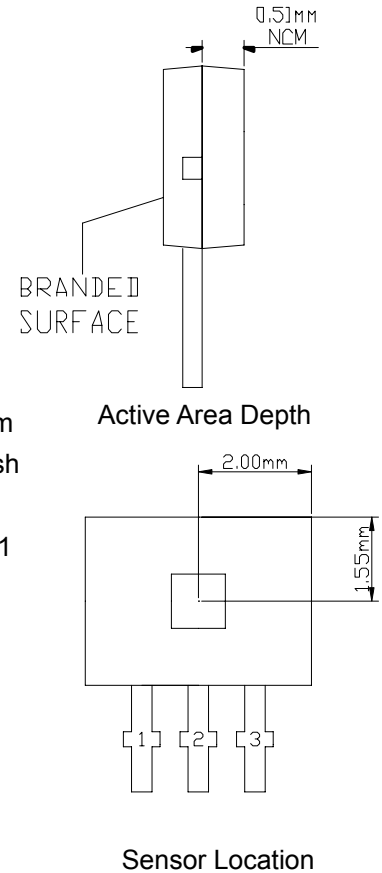


## SENSOR LOCATION, PACKAGE DIMENSION AND MARKING

### UA package: TO92S



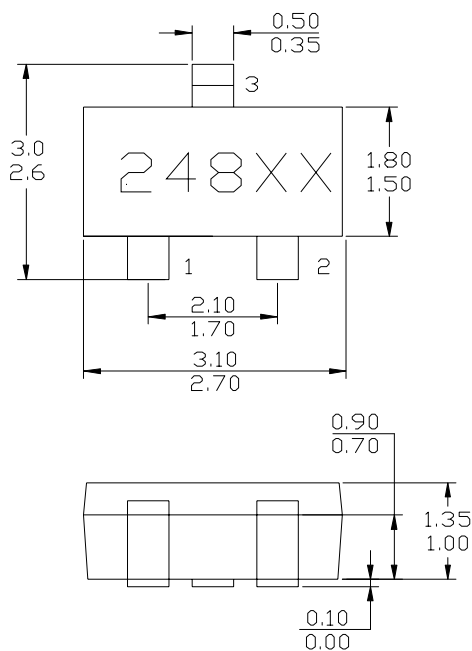
### TO92S Hall plate/ Chip location



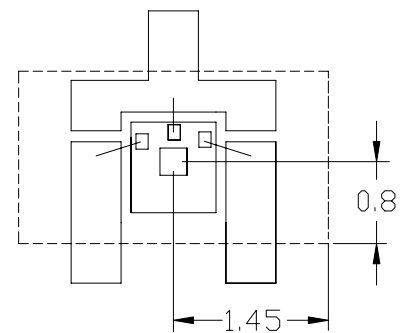
#### NOTES:

1. Controlling dimension: mm
2. Leads must be free of flash and plating voids
3. Do not bend leads within 1 mm of lead to package interface
4. PINOUT:  
Pin 1 Vcc  
Pin 2 GND  
Pin 3 Output

### SO package: SOT23 (Top view)



### SOT-23 Hall plate/ Chip location (Bottom view)



#### NOTES:

1. PINOUT (See Top View at left :)  
Pin 1 Vcc  
Pin 2 Output  
Pin 3 GND
2. Controlling dimension: mm
3. Lead thickness after solder plating will be 0.254mm maximum