## Description

Combining chopper-stabilization techniques to provide accurate and stable magnetic switch points, the EC2648 Hall effect sensor IC is fabricated in CMOS technology.
An internally controlled clocking mechanism, serving to place the high current-consuming portions of the circuit into a “power down” mode, is designed to cycle power to the Hall element and analog signal processing circuits. Periodically the device is “power on” by this internal logic and the magnetic flux from the Hall element is evaluated against the predefined thresholds. If the flux density is above or below the Bop/Brp thresholds, the output transistor is driven to change states accordingly. While in the “power down” cycle, the output transistor is latched in its previous state. The design has been optimized for service in applications requiring extended operating lifetime in battery-powered systems.

The output transistor of the EC2648 will be latched on ($B_{OP}$) in the presence of a sufficiently strong south or North magnetic field the marked side of the package. The output will be latched off ($B_{RP}$) in the absence of a magnetic field.

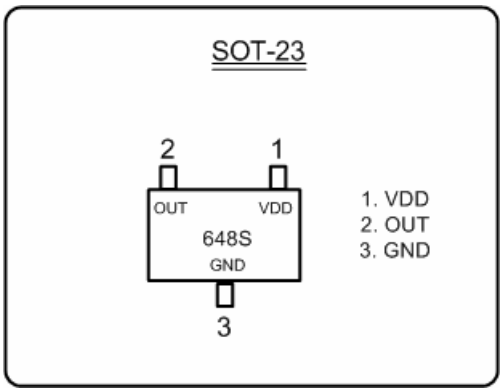
## Features

- Internal chopper-stabilization amplifier
- Micropower consumption for battery-powered application
- Output switches with absolute value of North or South pole from magnet
- High Sensitivity for direct reed switch replacement applications

## Applications

- Solid state switch
- Handheld Wireless Handset Awake Switch
- Lid close sensor for battery powered devices
- Magnet proximity sensor for reed switch replacement in low duty cycle application

## Pin Configuration




## Pin Descriptions

| PIN NO .<br>SOT-23 | Symbol | Description |
|---|---|---|
| 1 | VDD | Power Supply Pin |
| 2 | OUT | Open Drain Output Pin |
| 3 | GND | Ground |

## Ordering Information

| **Part No .** | **Temperature Suffix** | **Package** | **Temperature Range** |
|---|---|---|---|
| EC2648-B3 | E | SOT-23. | -40 to 85℃ Extended |
| EC2648-B3-F(lead-free) | E | SOT-23. | -40 to 85℃ Extended |

*NOTE: B package type

## Absolute Maximum Ratings

| | |
|---|---|
| Supply Voltage (Operating). $V_{DD}$ | .....3V |
| Supply Current (Fault). $I_{DD}$ | .....5mA |
| Output Voltage, $V_{OUT}$ | .....5V |
| Output Current (Fault) , $I_{OUT}$ | .....5mA |
| Operating Temperature Range , $T_A$ | .....-40 to 85 ℃ |
| Storage Temperature Range , $T_S$ | .....-55 to 150 ℃ |

## Electrical Specifications

DC operating parameters : $T_A$ = 25℃, VDD = 3V ( Unless otherwise specified )

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| Supply Voltage | $V_{DD}$ | Operating | 2.7 | 3.0 | 3.3 | V |
| Supply Current | $I_{DD}$ | Average | | 10 | | uA |
| Output Current | $I_{out}$ | | | | 1 | mA |
| Saturation Voltage | $V_{SAT}$ | IOUT = 1mA | | | 0.4 | V |
| Awake mode time | $T_{aw}$ | Operating | | 150 | | us |
| Sleep mode time | $T_{sl}$ | Operating | | 50 | 70 | ms |

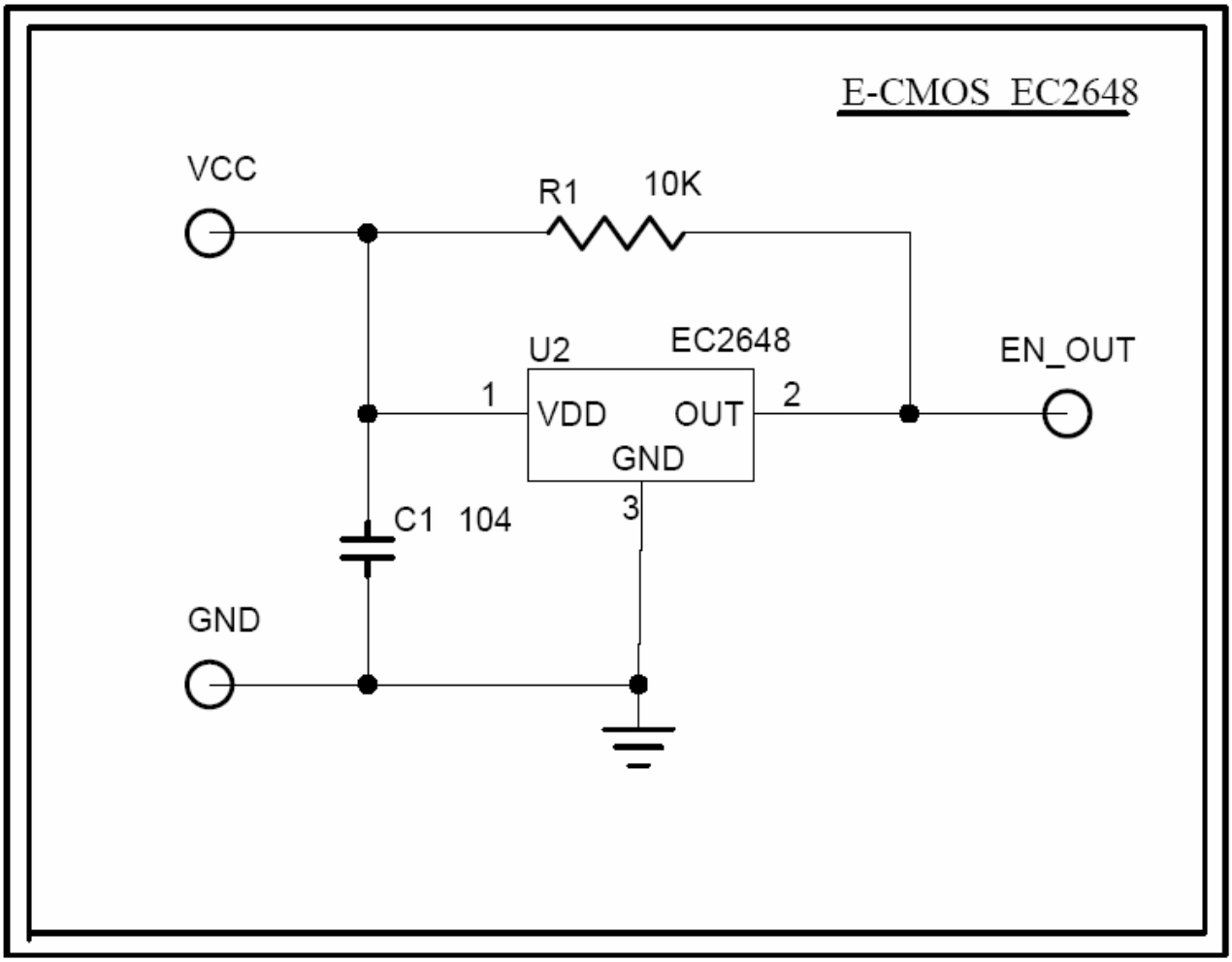
## Magnetic Specifications

DC operating parameters : $T_A$ = 25℃, VDD = 3V ( Unless otherwise specified )

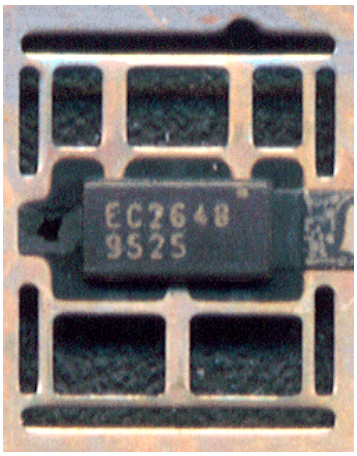
| Parameter | Symbol | Test Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| Operating Point | $B_{OP}$ | | ±3.0 | ±3.8 | ±6.0 | mT |
| Release Point | $B_{RP}$ | | ±0.5 | ±2.1 | | mT |
| Hysteresis | $B_{hys}$ | | | 1.7 | | mT |

**Note : 1mT = 10 Gauss**

## Application Schematic

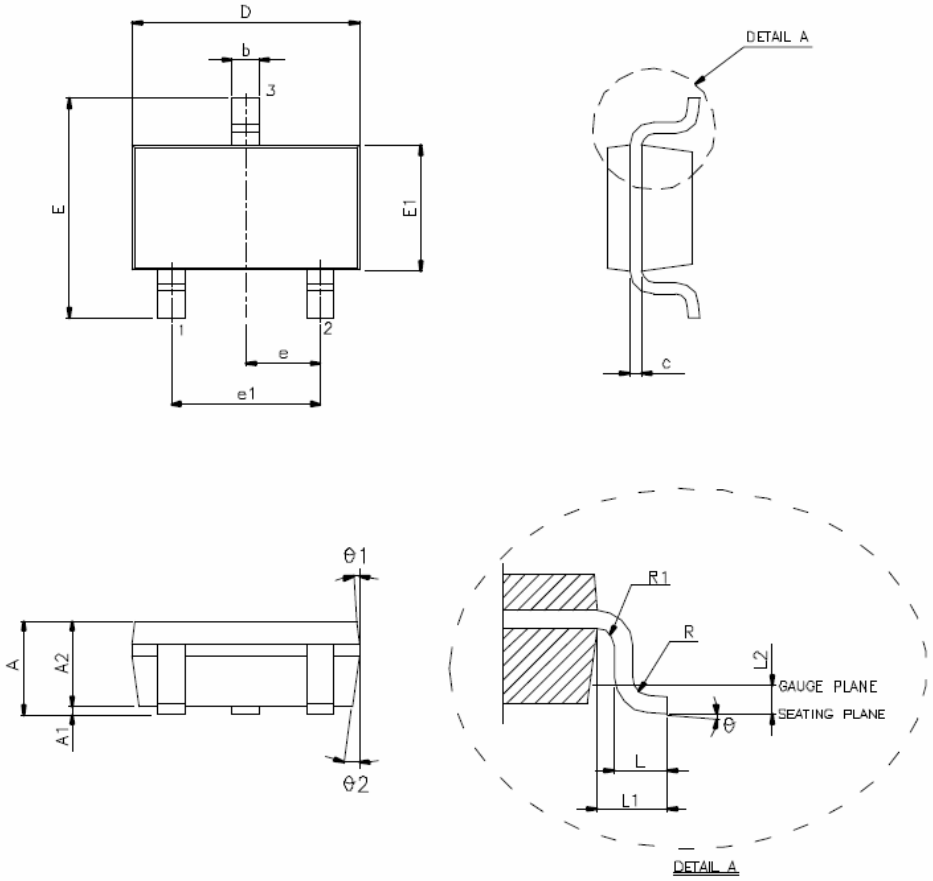



## Device Marking Diagram




The EC2648 is parts id, and the 9525 is lot id.

# Package Information




VARIATION(ALL DIMENSIONS SHOWN IN MM)

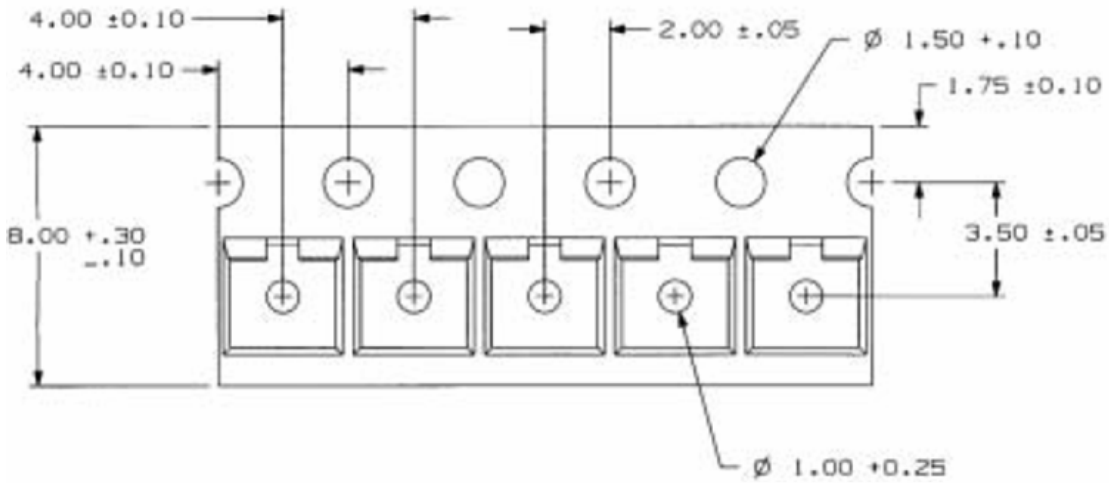
| SYMBOL | MIN. | NOM. | MAX. |
|---|---|---|---|
| A | – | – | 1.45 |
| A1 | – | – | 0.15 |
| A2 | 0.90 | 1.15 | 1.30 |
| b | 0.30 | – | 0.50 |
| c | 0 08 | – | 0.22 |
| D | | 2.90 BSC. | |
| E | | 2.80 BSC. | |
| E1 | | 1.60 BSC. | |
| e | | 0.95 BSC | |
| e1 | | 1.90 BSC. | |
| L | 0 30 | 0.45 | 0.60 |
| L1 | | 0.60 REF. | |
| L2 | | 0.25 BSC. | |
| R | 0.10 | – | – |
| R1 | 0.10 | – | 0.25 |
| θ | 0° | 4° | 8° |
| θ1 | 5° | 10° | 15° |

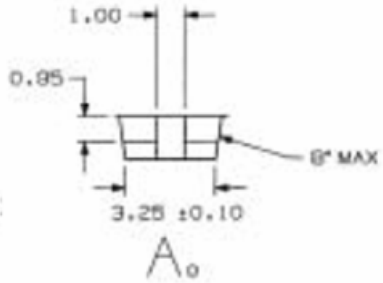
NOTE : OUTLINE : N/A

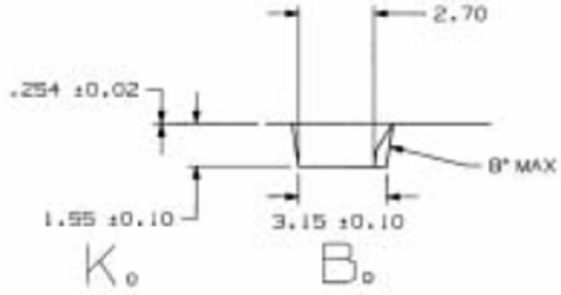
# II. Tape &Reel Drawing

## Taping Form and Dimensions

Dimensions shown in millimeters

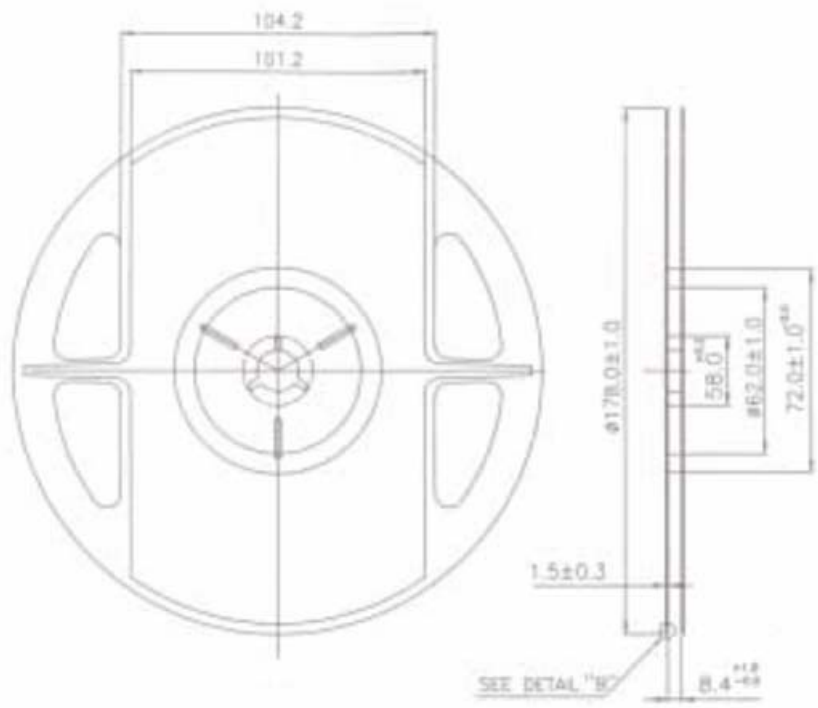


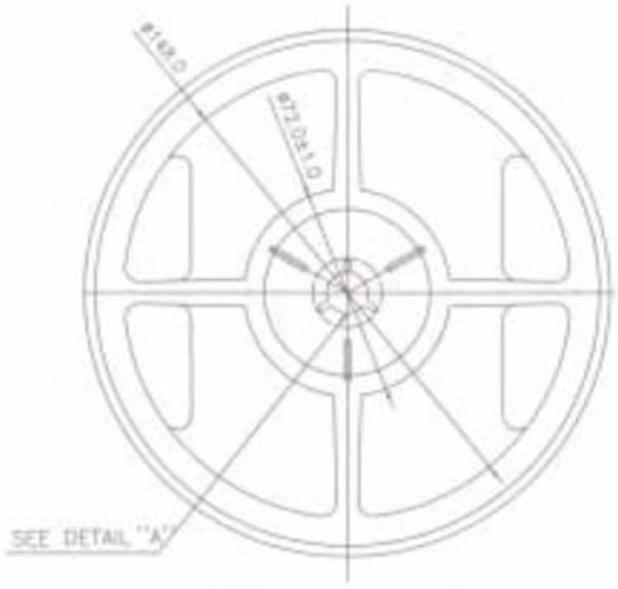



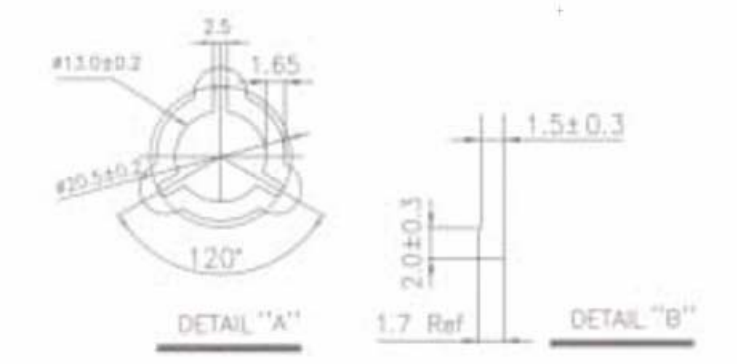
## Reel Form and Dimensions

Dimensions shown in millimeters




REEL COLOR : BLACK


2.5
1.65
120°
DETAIL "A"
1.5±0.3
2.0±0.3
1.7 Ref
DETAIL "B"


50PCS(MIN)
50PCS(MIN)

# III. Reliability Test

# E-CMOS EC2648 SOT23 Reliability Test

| Item | Condition | Standard | Result |
|---|---|---|---|
| Pre-conditioning | TC 5 cycle, Dry Bake 24Hrs,<br>T/H Soak 30℃/60%RH 192HR or 60℃/60%RH 40Hrs(JEDEC LEVEL 3)<br>For peak temp. 240℃ 3times | JESD22-A113 | PASS |
| HTOL | 125℃/ 168Hrs<br>VCC=max operating voltage | MIL-STD-883D, method 1005.7 or<br>JESD22-A108-B | PASS |
| TCT | -65℃~+150℃,200 cycles | MIL －STD- 883D | PASS |
| PCT | 121℃, 2atm, 96hrs. | JESD-22-A102-B | PASS |
| ESD | H.B.M>2KV,MM>200V | MIL-STD-883D 3015.7(H.B.M)<br>JEDEC EIA/JESD22-A115(M.M) | PASS |
| Latch-Up | Itr>100mA | JEDEC STANDARD No.78 | PASS |