



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 B_{OP} / B_{RP} 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.

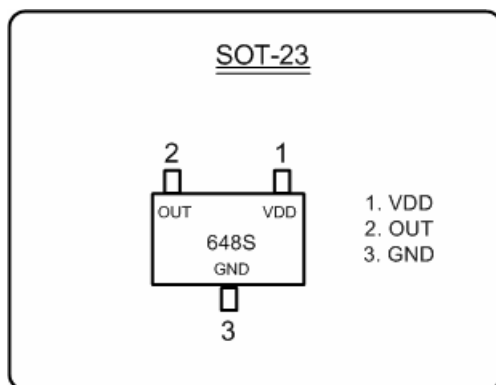
Features

- 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 .	Symbol	Description
SOT-23		
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°C Extended
EC2648-B3-F(lead-free)	E	SOT-23.	-40 to 85°C 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 °C
Storage Temperature Range , T_S	-55 to 150 °C

Electrical Specifications

DC operating parameters : $T_A = 25^{\circ}\text{C}$, $V_{DD} = 3\text{V}$ (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		μA
Output Current	I_{out}				1	mA
Saturation Voltage	V_{SAT}	$I_{OUT} = 1\text{mA}$			0.4	V
Awake mode time	T_{aw}	Operating		150		μs
Sleep mode time	T_{sl}	Operating		50	70	ms

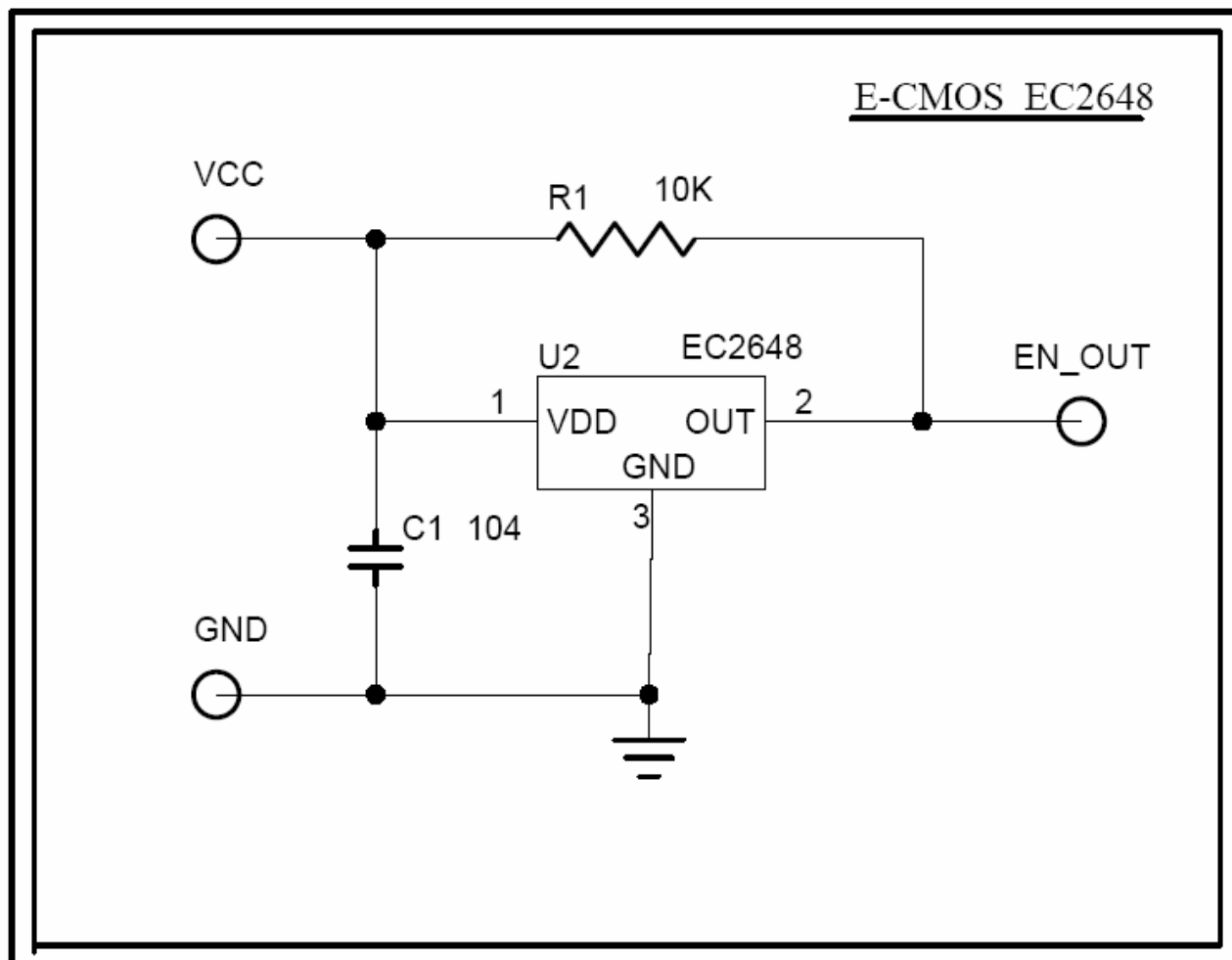
Magnetic Specifications

DC operating parameters : $T_A = 25^{\circ}\text{C}$, $V_{DD} = 3\text{V}$ (Unless otherwise specified)

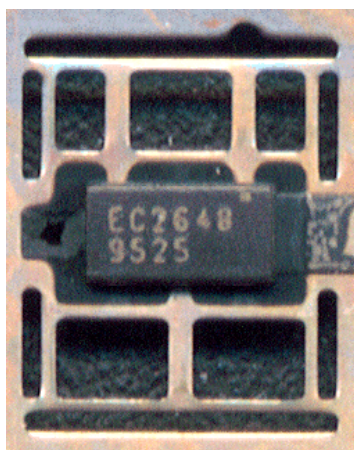
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Operating Point	BOP		± 3.0	± 3.8	± 6.0	mT
Release Point	BRP		± 0.5	± 2.1		mT
Hysteresis	B_{hys}			1.7		mT

Note : 1mT = 10 Gauss

Application Schematic

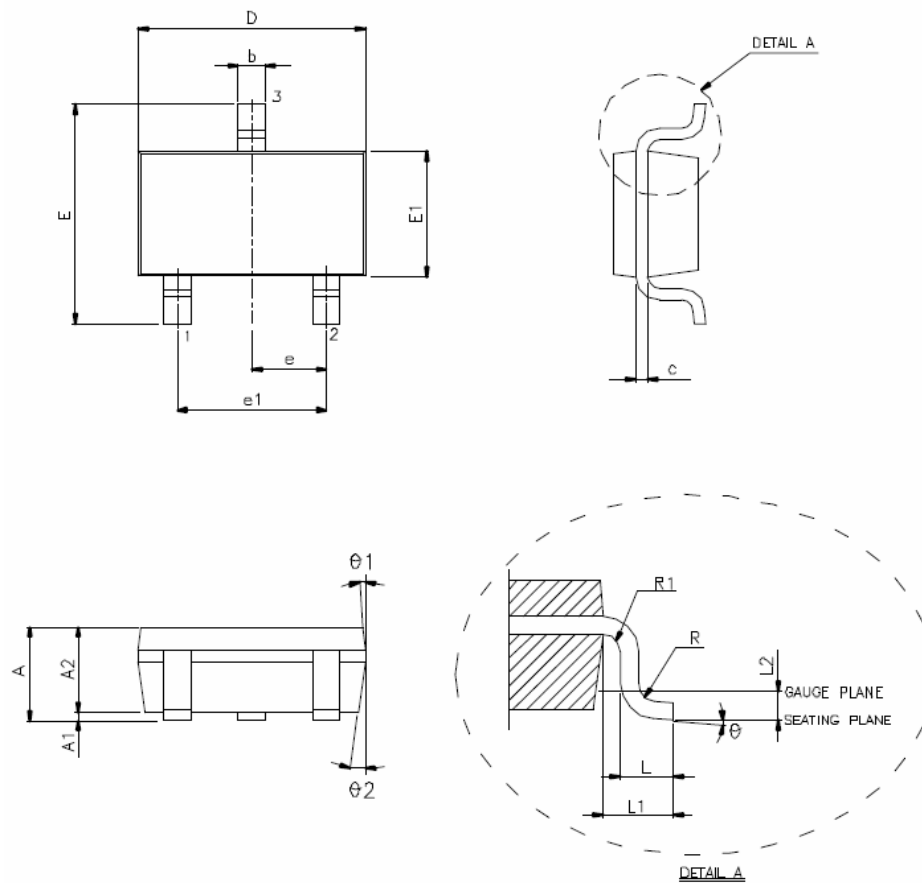


Device Marking Diagram



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°

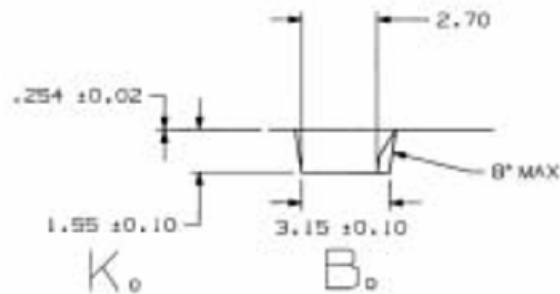
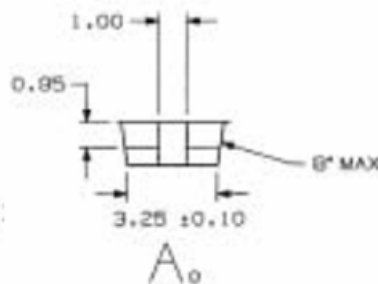
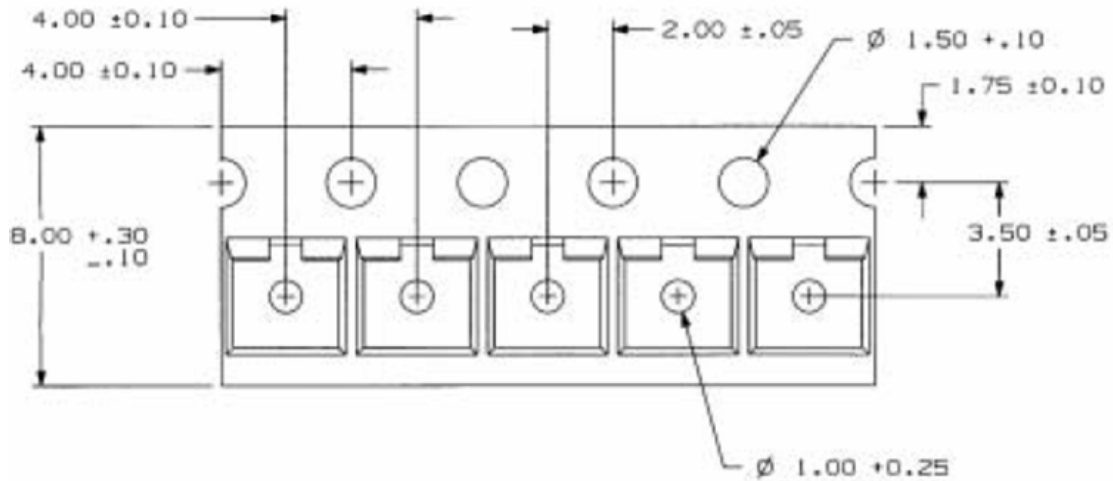
NOTE : OUTLINE : N/A



II. Tape & Reel Drawing

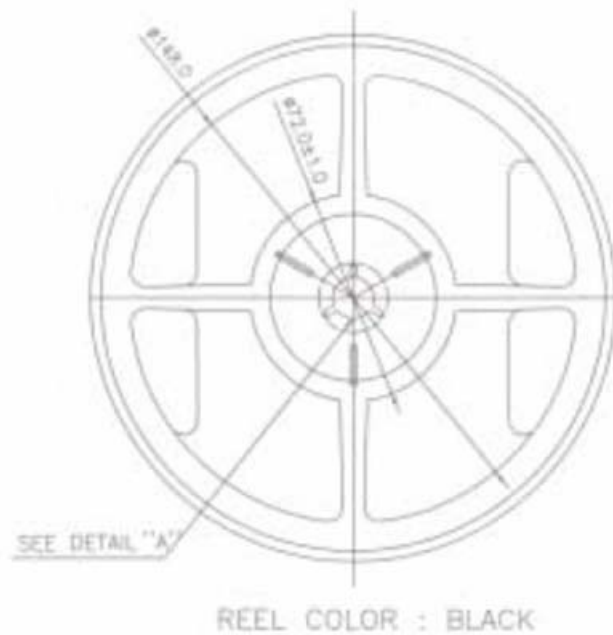
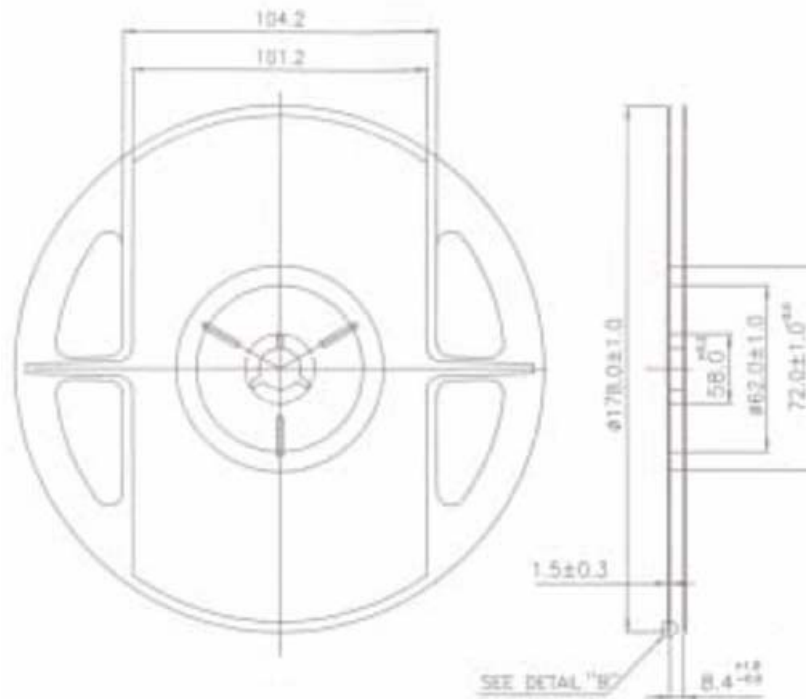
Taping Form and Dimensions

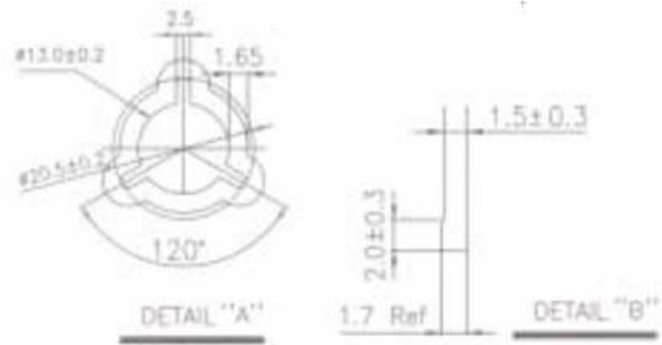
Dimensions shown in millimeters



Reel Form and Dimensions

Dimensions shown in millimeters







III. Reliability Test



E-CMOS EC2648 SOT23 Reliability Test

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