



ORIENT-CHIP

General Description

The OCH1661 Omnipolar Hall effect sensor IC is fabricated from mixed signal CMOS technology. It is comprised of two Hall plates and a CMOS output driver, mainly designed for battery-operation. The total power consumption in normal operation is typically 3.6μW with a 1.8V power source and 18.5μW with a 5V power source. Either north or south poles of sufficient strength will turn the output on. The output will be turn off under no magnetic field. While the magnetic flux density (B) is larger than operating point (BOP), the output will be turn on (low), the output is held until B is lower than release point (BRP), and then turned off.

The OCH1661 is available in many flexible packaging options, such as SOT23-3L/SIP-3L. Operating temperature range of the OCH1661 is from -40°C to 85°C.

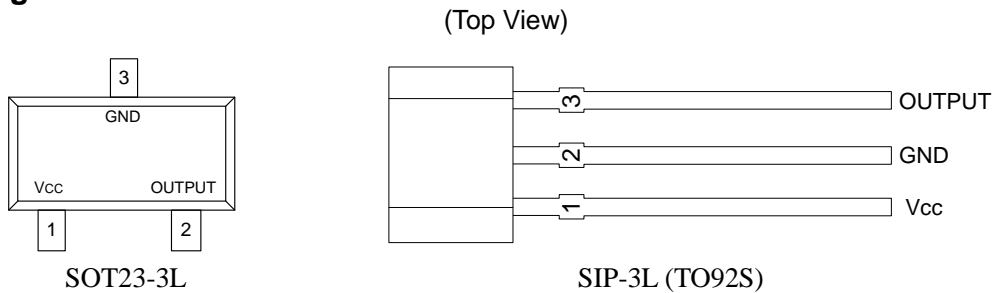
Features

- 2uA Micro power design
- Operation with North or South pole(omnipolar)
- CMOS Output
- 1.65V to 5.5V battery operation
- High sensitivity and high stability of the magnetic switching points
- High resistance to mechanical stress
- Digital output signal
- Good RF noise immunity
- -40°C o 85°C operating temperature
- SOT23-3L/SIP-3L(TO92S) package

Applications

- Smart meter
- toys
- Cover switch in Notebook PC/PDA
- Contact-less switch in consumer products
- Solid State Switch
- Handheld Wireless Handset Awake Switch
- Lid close sensor for battery-powered devise
- Magnet proximity sensor for reed switch replacement in low duty cycle applications

Pin Configuration



Pin Name	Pin		Description
	SOT23-3L	SIP-3L	
Vcc	1	1	IC Power Supply
OUTPUT	2	3	It is low state during the S/N magnetic field
GND	3	2	IC Ground

Application Circuit

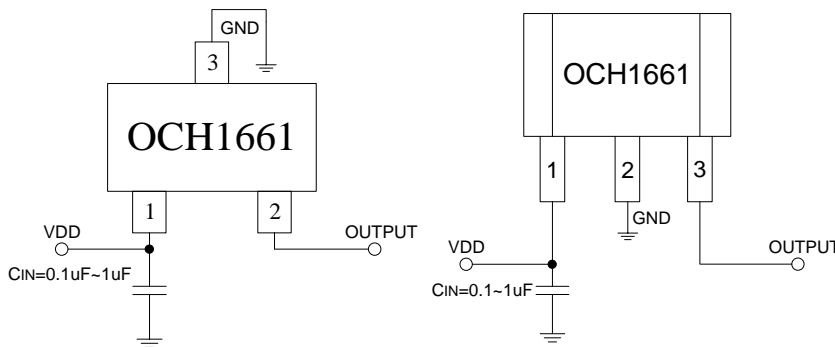


Figure 1, application circuit

Note: C_{IN} is for power stabilization and to strengthen the noise immunity, the recommended capacitance is 0.1~1uF.



Ordering Information

Part Number	Package Type	Packing Qty	B _{OP} (Gauss)	B _{RP} (Gauss)	Temperature	Eco Plan	Lead
OCH1661WAD	SOT23-3L	3000pcs/Reel	±40(Typ.)	±30(Typ.)	-40~ +85°C	ROHS	Cu
OCH1661MD	SIP-3L	1000pcs/Bag	±40(Typ.)	±30(Typ.)	-40~ +85°C	ROHS	Cu

Block Diagram

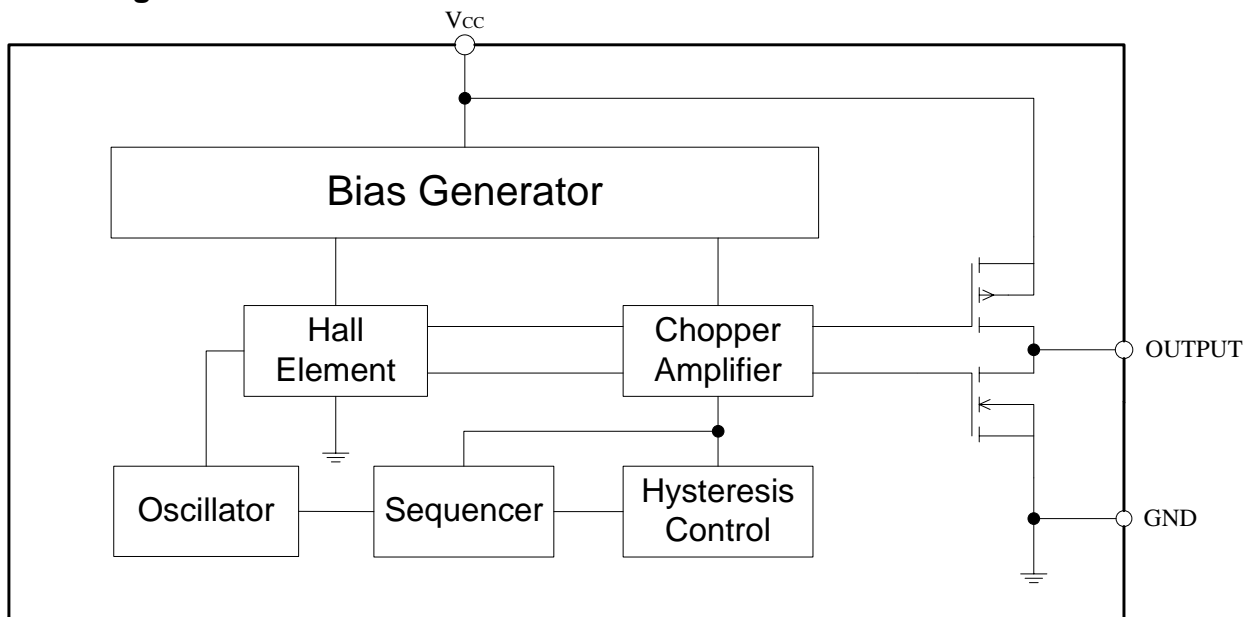


Figure 2, Block Diagram Of OCH1661

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Rating	Unit
V _{CC} to GND	V _{CC}	-0.3 to 6	V
Magnetic Flux Density	B	Unlimited	
Storage Temperature Range	T _S	-65 to +150	°C
Operating Junction Temperature Range	T _J	-40 to 150	°C
Maximum Power Dissipation	SOT23-3L	230	mW
	SIP-3L	300	
Maximum Soldering Temperature(at leads, 10 sec)	T _{LEAD}	260	°C

Recommended Operating Conditions (T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Rating	Unit
Supply Voltage	V _{DD}	Operating	1.65 ~ 5.5	V
Operating Temperature Range	T _A	Operating	-40 ~ +85	°C



■ **Electrical Characteristics**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit	
V _{OH}	Output On Voltage (High side)	T _A =-40~85°C, V _{DD} = 1.65~5.5V I _{OUT} =+1mA	V _{DD} -0.3	V _{DD} -0.02	V _{DD}	V	
V _{OL}	Output On Voltage (Low side)	T _A =-40~85°C, V _{DD} = 1.65~5.5V I _{OUT} =-1mA	-	0.01	0.1	V	
I _{cc} (EN)	Supply Current	Chip enable, T _A =25°C, V _{DD} = 1.8V		0.5	1.2	mA	
I _{cc} (EN)		Chip enable, T _A =25°C, V _{DD} = 5V	-	1.1	1.8	mA	
I _{cc} (EN)		Chip enable, T _A =-40~85°C, V _{DD} = 1.65~5.5V	-	1.1	2.6	mA	
I _{cc} (DIS)		Chip disable, T _A =25°C, V _{DD} = 1.8V		0.8	2	μA	
I _{cc} (DIS)		Chip disable, T _A =25°C, V _{DD} = 5V	-	1.9	3	μA	
I _{cc} (DIS)		Chip disable, T _A =-40~85°C, V _{DD} = 1.65~5.5V	-	1.9	4	μA	
I _{cc} (AVG)		Average supply current, T _A =25°C, V _{DD} =1.8V			1.7	4	μA
I _{cc} (AVG)		Average supply current, T _A =25°C, V _{DD} =5V	-	3.7	6	μA	
I _{cc} (AVG)		Average supply current, T _A =-40~85°C, V _{DD} = 1.65~5.5V	-	3.7	8	μA	
T _{awake}		Awake Time	T _A =-40~85°C, V _{DD} = 1.65~5.5V -	-	70	120	μs
T _{period}	Period	T _A =-40~85°C, V _{DD} = 1.65~5.5V	-	36	80	ms	
D.C.	Duty Cycle	T _A =-40~85°C, V _{DD} = 1.65~5.5V	-	0.2	-	%	

■ **Magnetic Characteristics**

V _{DD} =1.65~5.5V, T _a =25°C						
Parameter	Symbol	Min.	Typ.	Max.	Unit	
South Pole Operate point	B _{OPS}	20	40	55	Gauss	
South Pole Release point	B _{RPS}	10	30	48	Gauss	
North Pole Operate point	B _{OPN}	-55	-40	-20	Gauss	
North Pole Release point	B _{RPN}	-48	-30	-10	Gauss	
Hysteresis	B _{HYS}	-	10	-	Gauss	

■ **Output VS Magnetic Pole**

Part Number	Magnetic Pole	Test Conditions	Output
OCH1661	South Pole	B > B _{OPS}	Low
OCH1661	South Pole	B < B _{RPS}	High
OCH1661	North Pole	B < B _{OPN}	Low
OCH1661	North Pole	B > B _{RPN}	High

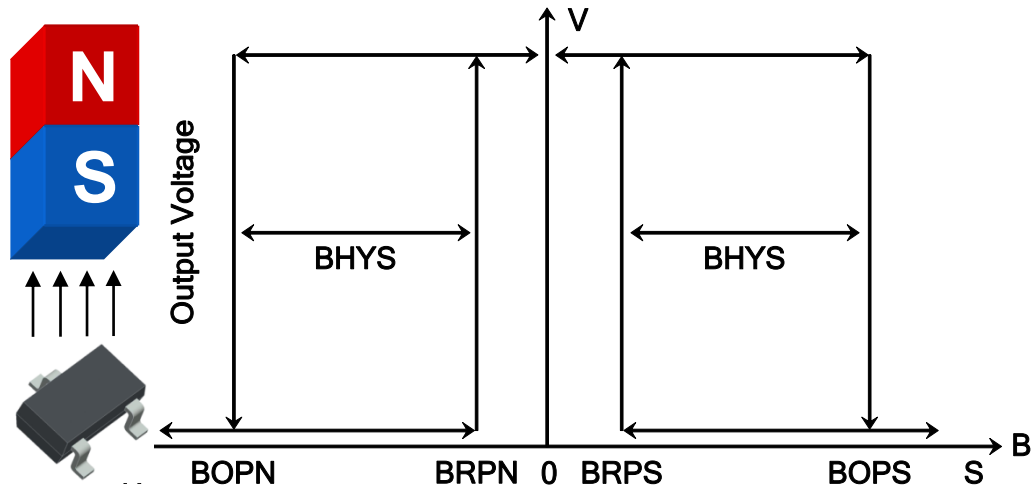


Figure 3, Magnetic Operational Characteristics Of OCH1661

■ Hall Sensor Location

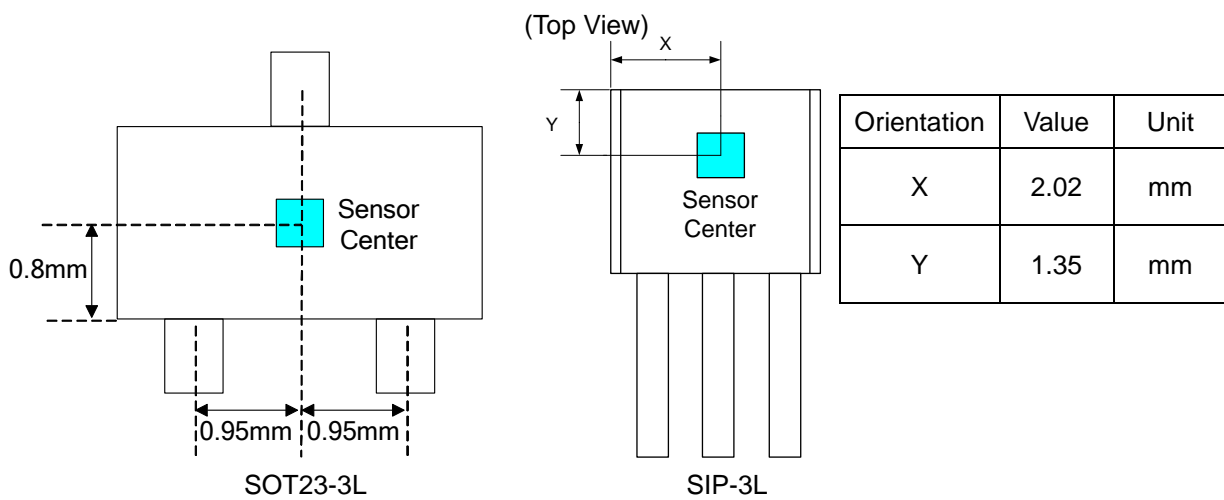


Figure4, Hall Sensor Location



■ Land Pattern (for reference only)

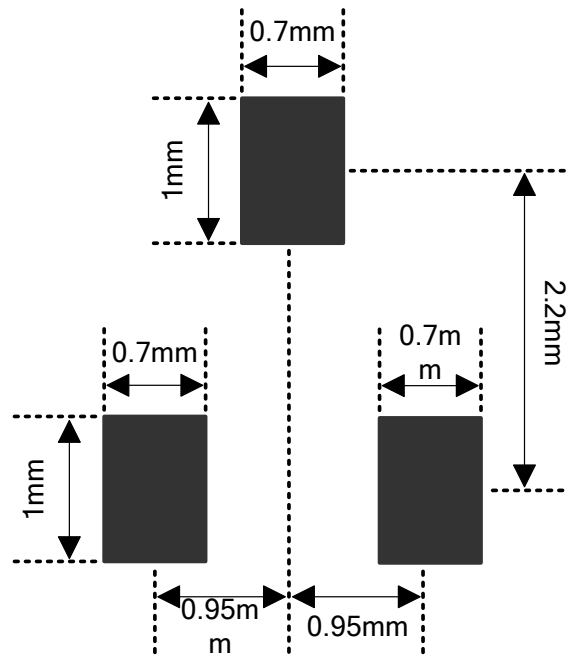
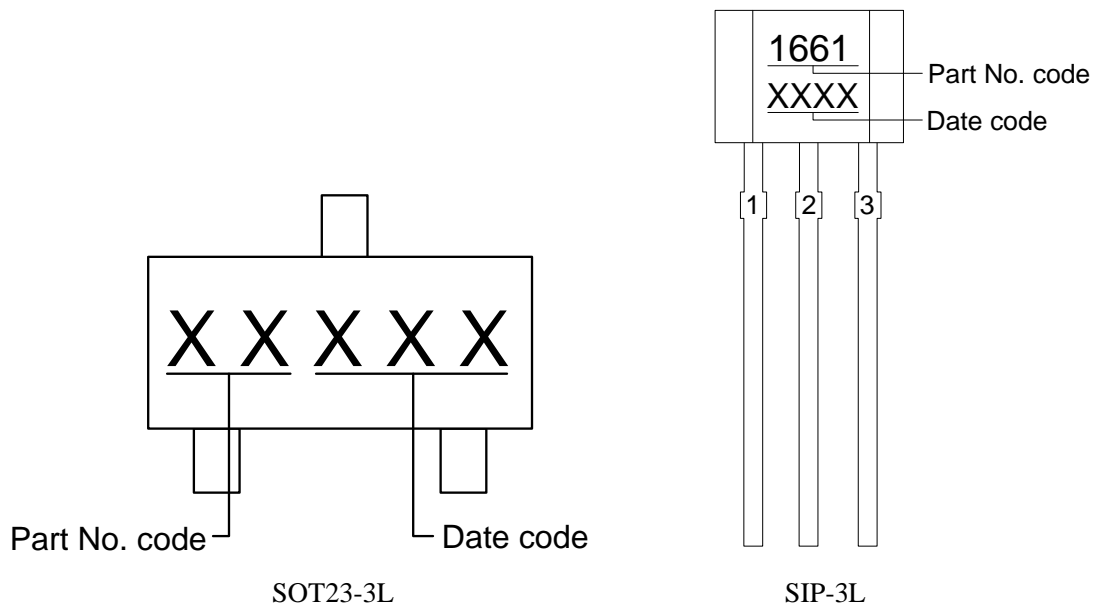


Figure 5, Land Pattern Dimension (SOT23-3L)

■ Marking Information

(Top View)





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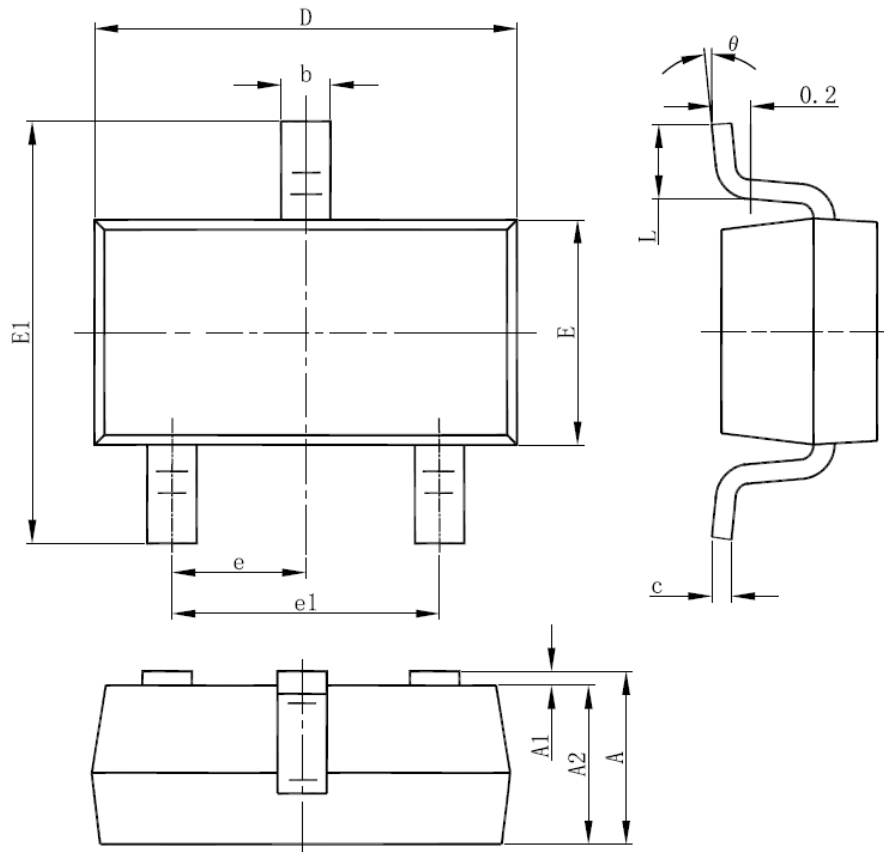
OCH1661

Micro Power Omnipolar Hall-effect Sensor Switch

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■ **Package Information**

1)SOT23-3L



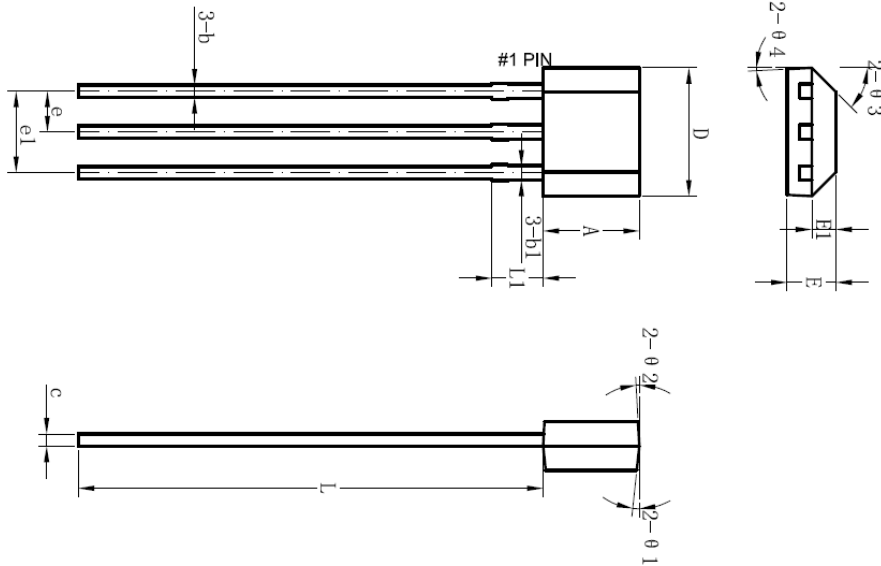
Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	1.050	1.15	1.250	0.041	0.045	0.049
A1	0.000	0.050	0.100	0.000	0.002	0.004
A2	1.050	1.100	1.150	0.041	0.043	0.045
b	0.300	0.400	0.500	0.012	0.016	0.020
c	0.100	0.150	0.200	0.004	0.006	0.008
D	2.820	2.920	3.020	0.111	0.115	0.119
E	1.500	1.600	1.700	0.059	0.063	0.067
E1	2.650	2.800	2.950	0.104	0.110	0.116
e1	1.800	1.900	2.000	0.071	0.075	0.079
e	0.950 REF			0.037 REF		
L	0.300	0.450	0.600	0.012	0.018	0.024
θ	0°	4°	8°	0°	4°	8°





■ **Package Information**

2) SIP-3L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.90	3.00	3.10	0.11	0.12	0.12
b	0.35	0.39	0.56	0.01	0.02	0.02
b1		0.44			0.02	
c	0.36	0.38	0.51	0.01	0.01	0.02
D	3.9	4.0	4.2	0.15	0.16	0.16
E	1.42	1.52	1.62	0.06	0.06	0.06
E1		0.75			0.03	
e		1.27			0.05	
e1		2.54			0.10	
L	13.50	14.50	15.50	0.53	0.57	0.61
L1		1.60			0.06	
Θ1		6°			0.24°	
Θ2		3°			0.12°	
Θ3		45°			1.77°	
Θ4		3°			0.12°	



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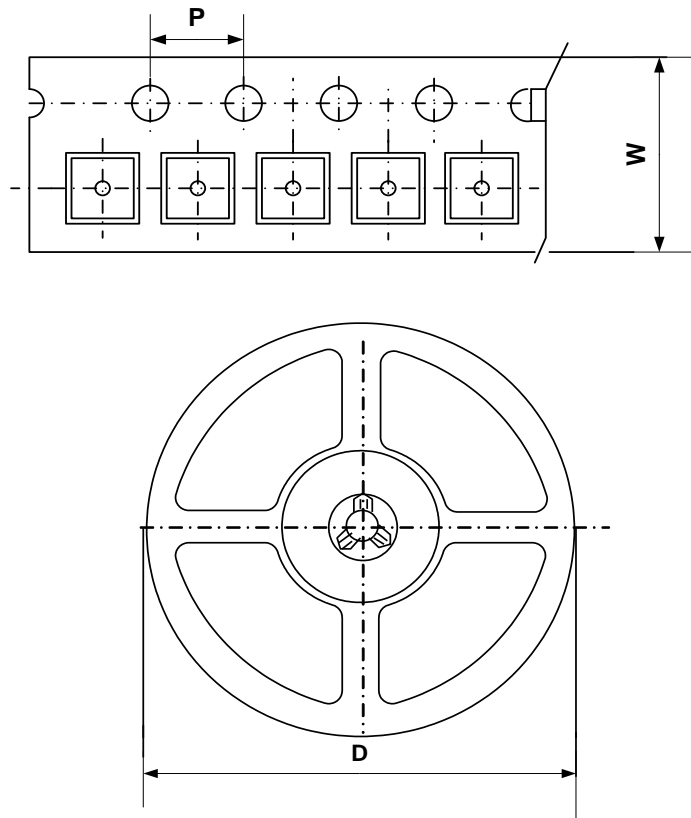
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Packing Information

1) SOT23-3L



Package Type	Carrier Width (W)	Pitch (P)	Reel Size(D)	Packing Minimum
SOT23-3L	8.0±0.1 mm	4.0±0.1 mm	180±1 mm	3000pcs

Note: Carrier Tape Dimension, Reel Size and Packing Minimum

2) SIP-3L

1. Packing Type: Bag
2. Packing minimum: 1000pcs/Bag





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