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■ **General Description**

The OCH4002 is Unipolar Hall effect sensor IC is fabricated from mixed signal CMOS technology. It is comprised of one Hall plate and a CMOS output drive, mainly designed for battery-operation. The total power consumption in normal operation is typically 5.6μW with a 2.8V power source. South/North poles of sufficient strength will turn the output on. The output will be turned off under no magnetic field.

The OCH4002 is available in SIP-3L、SOT23-3L、TSOT23-3L、SOT553 Package. Operating temperature range of the OCH4002 is from -40°C to 85°C.

■ **Features**

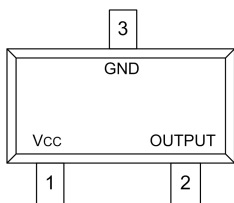
- 2uA Micro power consumption ideal for battery-powered applications
- Input Voltage Range: 1.65V to 5.5V
- Very High Sensitivity Hall Sensor
- Chopper stabilized amplifier stage
- Good RF noise immunity
- CMOS Output
- SOT23-3L、TSOT23-3L、SIP-3L、SOT553 package

■ **Applications**

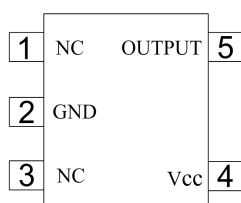
- Solid State Switch
- Bluetooth Headset

■ **Pin Configuration**

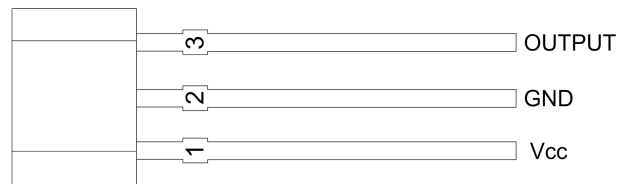
(Top View)



TSOT23-3L/SOT23-3L



SOT553



SIP-3L(TO92S)

Pin Name	Pin Number			Description
	SOT23-3L /TSOT23-3L	SOT553	SIP-3L	
V _{cc}	1	4	1	IC Power Supply
OUTPUT	2	5	3	OCH4002MD OCH4002WAD OCH4002TWAD OCH4002STAD It is low state during the S Pole magnetic field OCH4002NMD OCH4002NWAD OCH4002NTWAD OCH4002NSTAD It is low state during the N Pole magnetic field
GND	3	2	2	IC Ground
NC	-	1、3	-	Nc Pin

■ **Application Circuit**

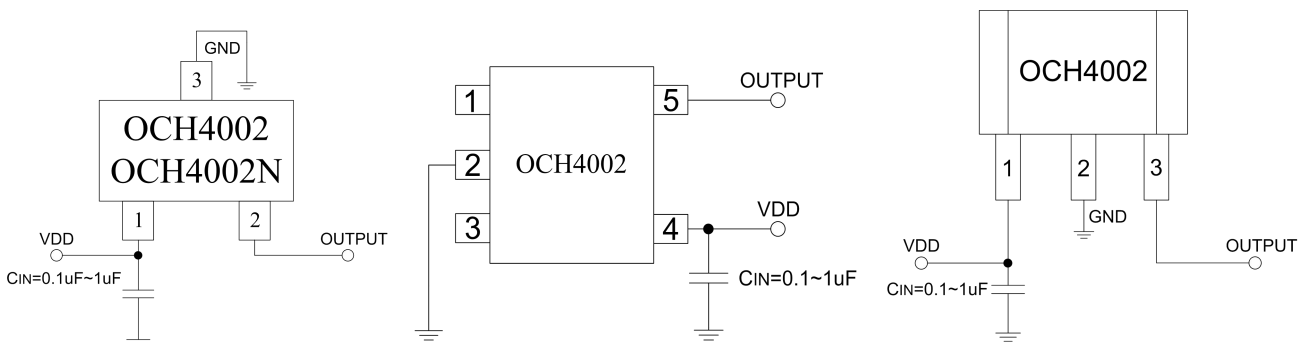


Figure 1, application circuit

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

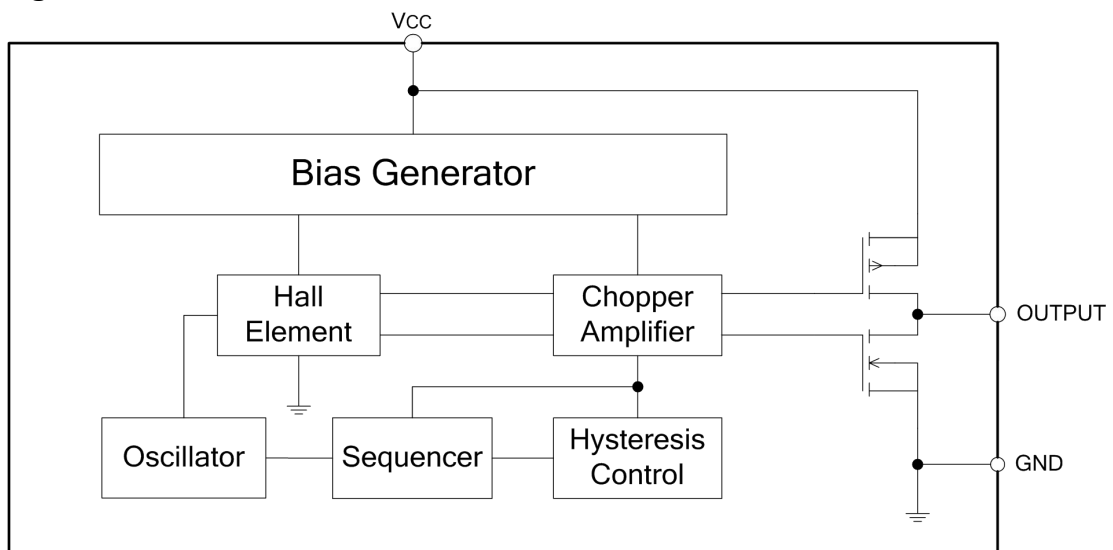


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Ordering Information

Part Number	Package Type	Packing Qty	B _{OP} (Gauss)	B _{RP} (Gauss)	Temperature	Eco Plan	Lead
OCH4002MD	SIP-3L	1000pcs/Bag	30(Typ.)	20(Typ.)	-40~ +85°C	ROHS	Cu
OCH4002NMD	SIP-3L	1000pcs/Bag	-30(Typ.)	-20(Typ.)	-40~ +85°C	ROHS	Cu
OCH4002WAD	SOT23-3L	3000pcs/Reel	30(Typ.)	20(Typ.)	-40~ +85°C	ROHS	Cu
OCH4002NWAD	SOT23-3L	3000pcs/Reel	-30(Typ.)	-20(Typ.)	-40~ +85°C	ROHS	Cu
OCH4002TWAD	TSOT23-3L	3000pcs/Reel	30(Typ.)	20(Typ.)	-40~ +85°C	ROHS	Cu
OCH4002NTWAD	TSOT23-3L	3000pcs/Reel	-30(Typ.)	-20(Typ.)	-40~ +85°C	ROHS	Cu
OCH4002STAD	SOT553	3000pcs/Reel	30(Typ.)	20(Typ.)	-40~ +85°C	ROHS	Cu
OCH4002NSTAD	SOT553	3000pcs/Reel	-30(Typ.)	-20(Typ.)	-40~ +85°C	ROHS	Cu

Block Diagram





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■ 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	SIP-3L	300	mW
	SOT23-3L	230	
	TSOT23-3L		
	SOT553		
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

(Unless otherwise noted, typical values are at T_A=25°C, V_{DD}=2.8V)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V _{OH}	Output Off Voltage (High side)	I _{OUT} =+1mA	V _{DD} -0.3	V _{DD} -0.1	V _{DD} +0.3	V
V _{OL}	Output On Voltage (Low side)	I _{OUT} =-1mA	-0.3	0.1	+0.3	V
I _{OFF}	Output Leakage Current	V _{OUT} =5V, Output off	-	<0.1	1	μA
I _{DD} (EN)	Supply Current	Chip enable, T _A =25°C, V _{DD} =2.8V	-	1.6	2.5	mA
I _{DD} (EN)		Chip enable, T _A =-40~85°C, V _{DD} = 1.6~5.5V	-	1.6	4	mA
I _{DD} (DIS)		Chip disable, T _A =25°C, V _{DD} =1.8V	-	0.6	1.3	μA
I _{DD} (DIS)		Chip disable, T _A =-40~85°C, V _{DD} = 1.65~5.5V	-	2	3	μA
I _{DD} (AVG)		Average supply current, T _A =25°C, V _{DD} =2.8V	-	2	4	μA
I _{DD} (AVG)		Average supply current, T _A =-40~85°C, V _{DD} = 1.65~5.5V	-	2	6	μA
T _{awake}		Awake Time	-	-	30	60
T _{period}	Period	-	-	30	80	ms
D.C.	Duty Cycle	-	-	0.1	-	%



■ **Magnetic Characteristics**

(Unless otherwise noted, typical values are at $T_A=25^\circ\text{C}$, $V_{DD}=2.8\text{V}$)

OCH4002MD、OCH4002WAD、OCH4002TWAD、OCH4002STAD					
Parameter	Symbol	Min.	Typ.	Max.	Unit
South Pole Operate Point	BOPS	10	30	55	Gauss
South Pole Release Point	BRPS	5	20	52	
Hysteresis	BHY (BOPS-BRPS)	-	10	-	

OCH4002NMD、OCH4002NWAD、OCH4002NTWAD、OCH4002NSTAD					
Parameter	Symbol	Min.	Typ.	Max.	Unit
North Pole Operate Point	BOPN	-55	-30	-10	Gauss
North Pole Release Point	BRPN	-52	-20	-5	
Hysteresis	BHY (BOPN-BRPN)	-	10	-	

■ **Output Vs. Magnetic Pole**

Part Number	Magnetic Pole	Test Conditions	Output Status
OCH4002MD、OCH4002WAD OCH4002TWAD、OCH4002STAD	South Pole	$B > BOPS$	Low
OCH4002MD、OCH4002WAD OCH4002TWAD、OCH4002STAD	South Pole	$B < BRPS$	High
OCH4002NMD、OCH4002NWAD OCH4002NTWAD、OCH4002NSTAD	North pole	$B < BOPN$	Low
OCH4002NMD、OCH4002NWAD OCH4002NTWAD、OCH4002NSTAD	North pole	$B > BRPN$	High

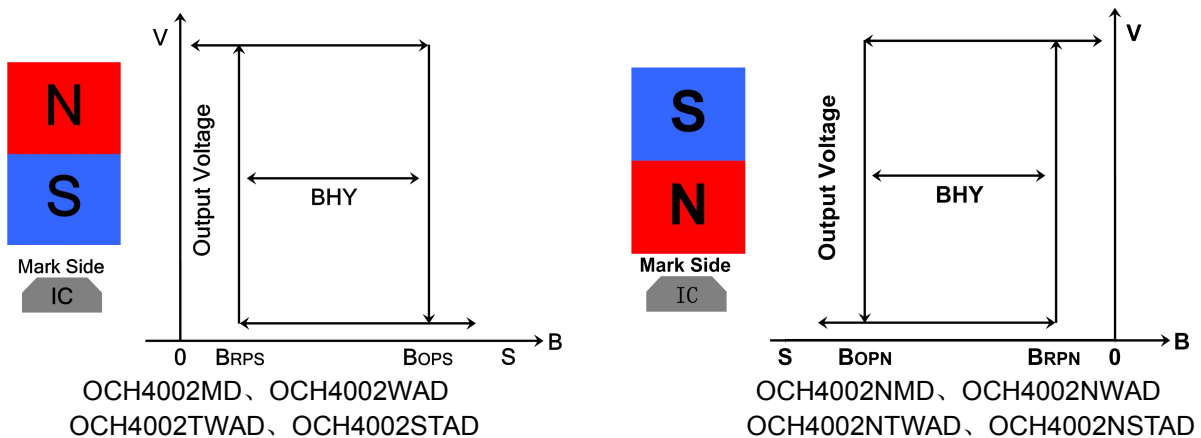


Figure 2, Magnetic Hysteresis Characteristics



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■ Hall Sensor Location

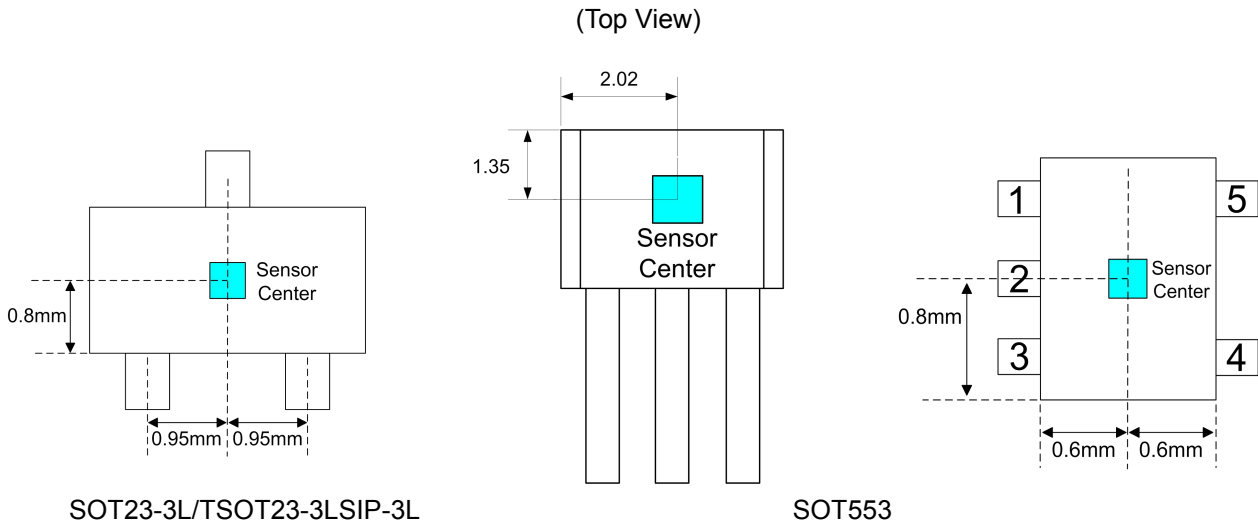
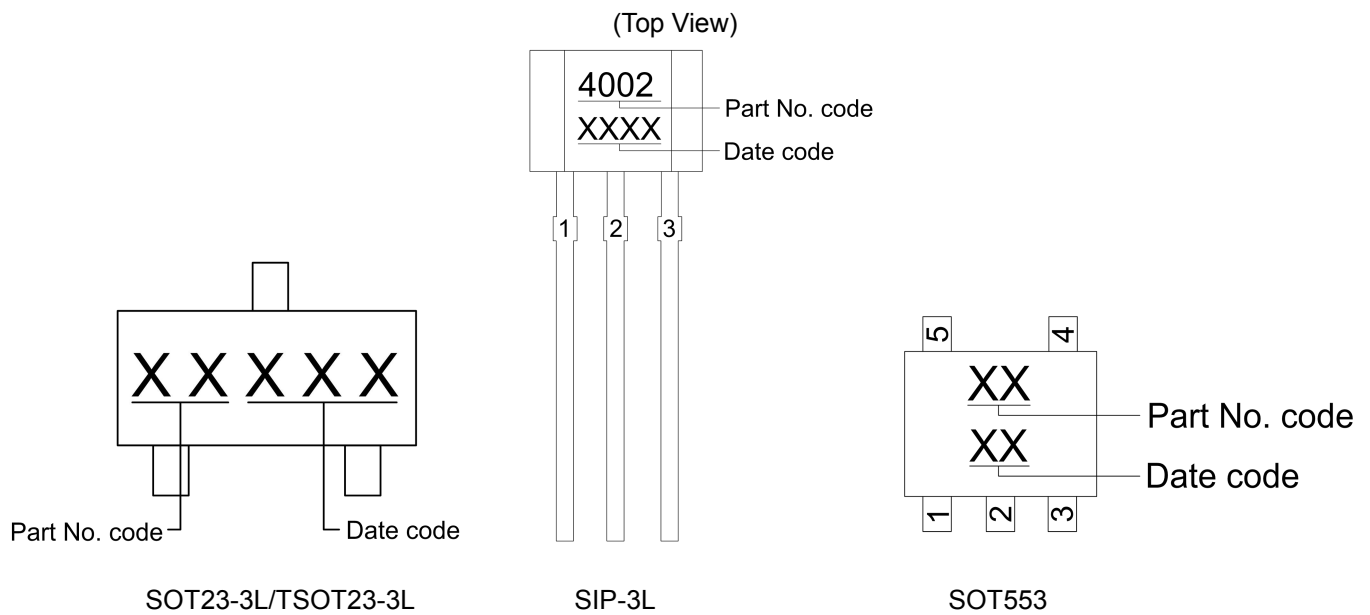


Figure4, Hall Sensor Location

■ Marking Information

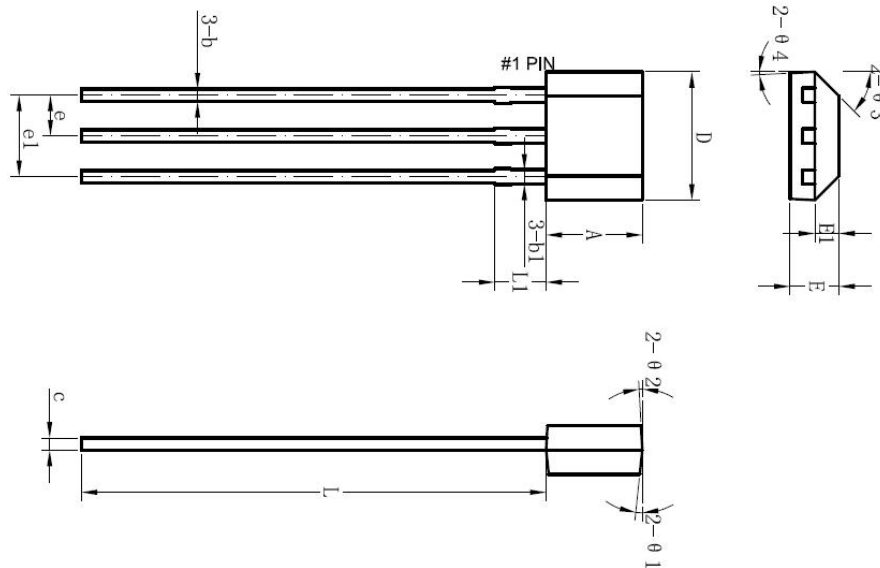




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■ **Package Information**

1)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°	



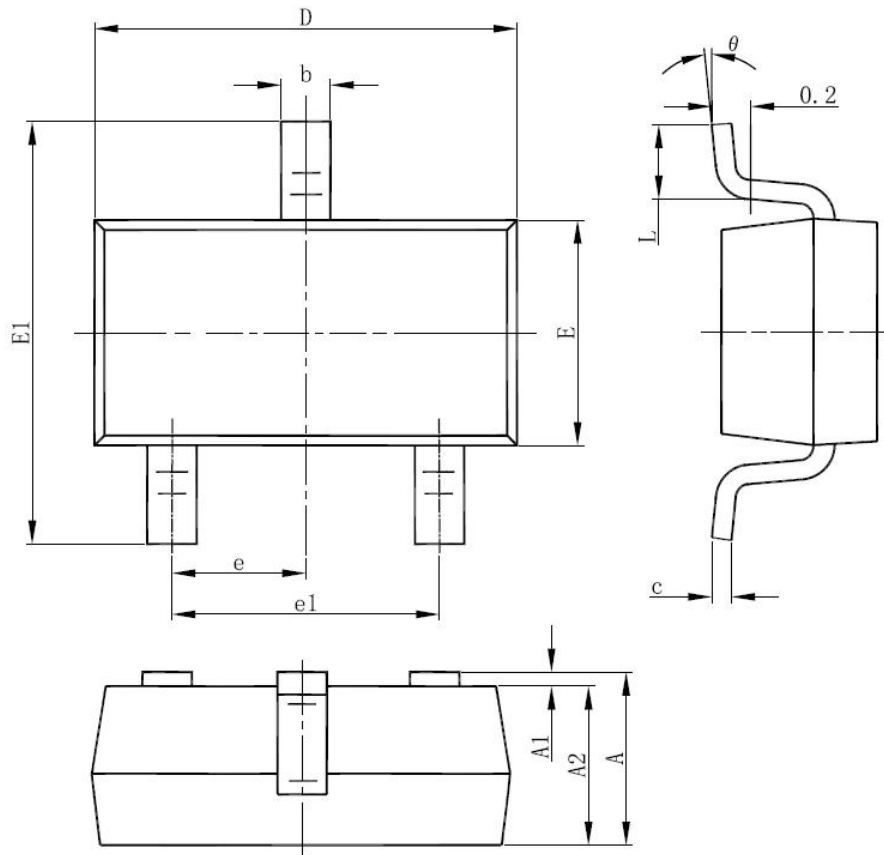
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OCH4002

Micro Power Unipolar Hall-effect Sensor Switch

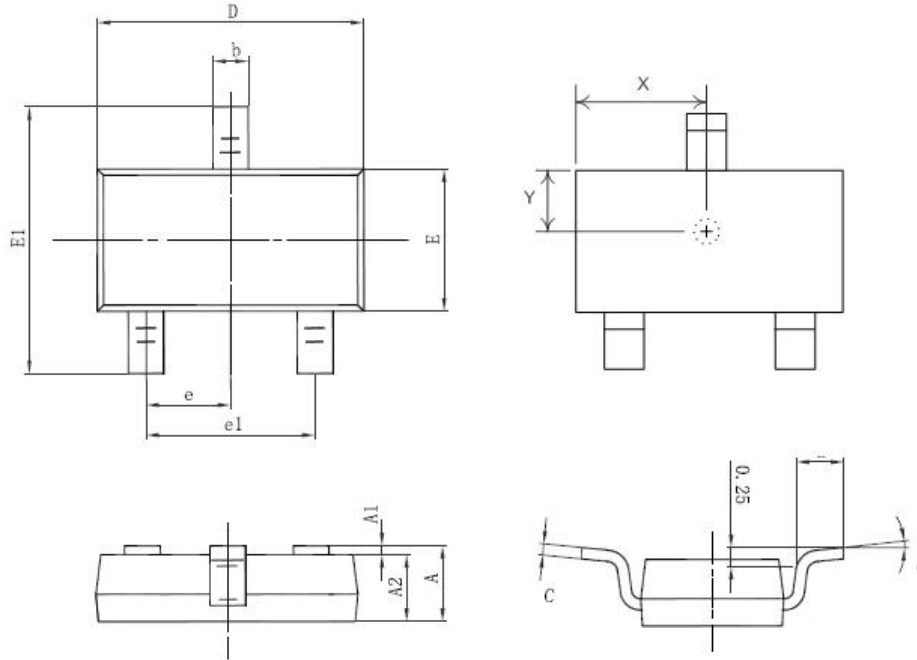
2)SOT23-3L



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	1.1	1.2	1.3	0.043	0.047	0.051
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
theta	0°	4°	8°	0°	4°	8°



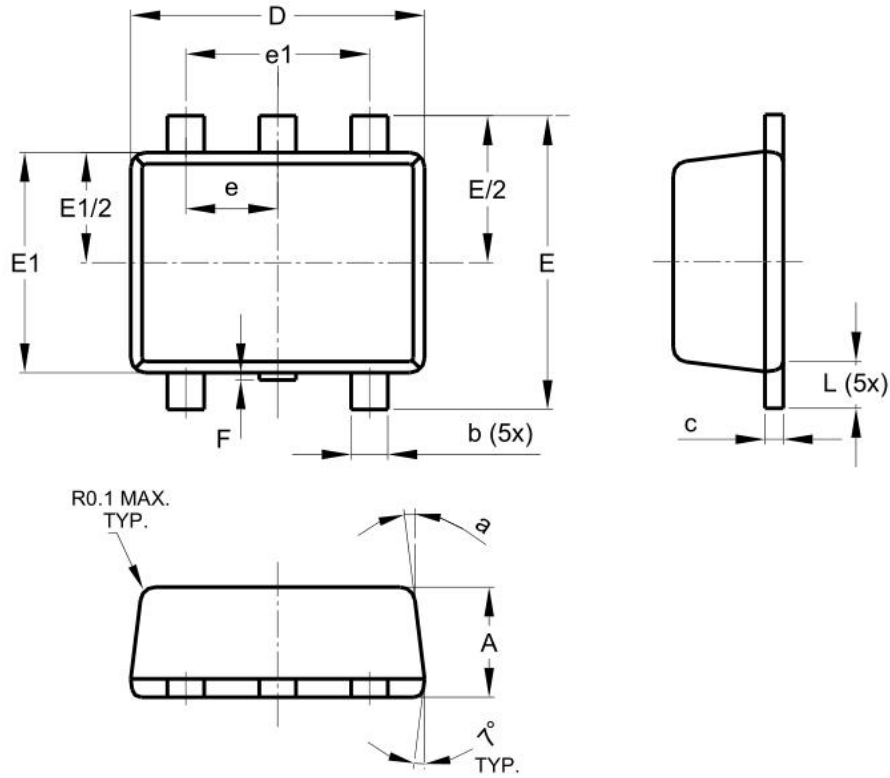
3)TSOT23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b	0.350	0.500	0.014	0.020
c	0.080	0.200	0.003	0.008
D	2.820	3.020	0.111	0.119
E	1.600	1.700	0.063	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.900(BSC)		0.075(BSC)	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°
X	1.410	1.510	0.056	0.059
Y	0.800	0.850	0.031	0.033



4) SOT553



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Norm.	Max.	Min.	Norm.	Max.
A	0.55	0.60	0.62	0.22	0.24	0.24
b	0.15	0.20	0.30	0.06	0.08	0.12
c	0.10	0.20	0.18	0.04	0.08	0.07
D	1.50	1.60	1.70	0.59	0.63	0.67
E	1.55	1.60	1.70	0.61	0.63	0.67
E1	1.10	1.20	1.25	0.43	0.47	0.49
e	0.50 (BSC)			0.20 (BSC)		
e1	1.00 (BSC)			0.39 (BSC)		
F	0.00	-	0.10	0.00	-	0.04
L	0.10	0.20	0.30	0.04	0.08	0.12
a	6°	7°	8°	-	-	-



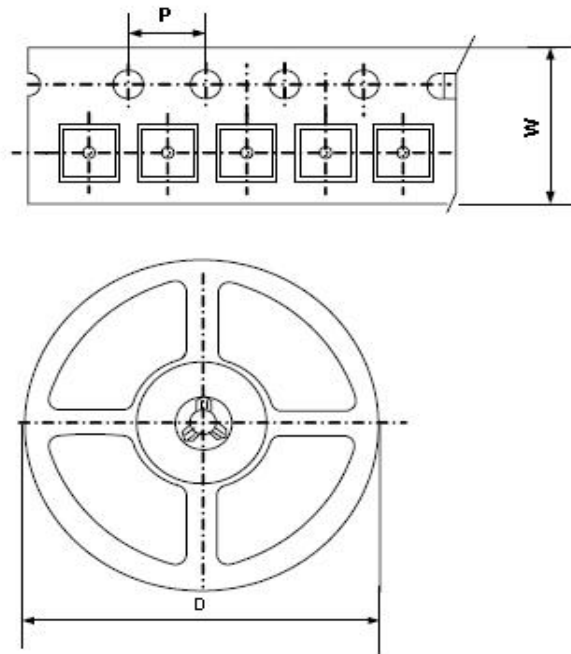
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■ **Packing Information**

1)SIP-3L

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

2)SOT23-3L/TSOT23-3L/SOT553



Package Type	Carrier Width (W)	Pitch (P)	Reel Size(D)	Packing Minimum
SOT23-3L /TSOT23-3L/SOT553	8.0±0.1 mm	4.0±0.1 mm	180±1 mm	3000pcs

Note: Carrier Tape Dimension, Reel Size and Packing Minimum



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OCH4002

Micro Power Unipolar Hall-effect Sensor Switch

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