■ General Description

The OCH168(OCH168A) is an Integrated Hall effect sensor designed specifically to meet the requirements of low-power devices. e.g. as an On/Off switch in Cellular Flip-Phones, with battery operating voltages of 2.4V~ 5.5V.

Precise magnetic switching points and high temperature stability are achieved through the unique design of the internal circuit.

An onboard clock scheme is used to reduce the average operating current of the IC.

During the operate phase the IC compares the actual magnetic field detected with the internally compensated switching points. The output is switched at the end of each operating phase.

During the Stand-by phase the output stage is latched and the current consumption of the device reduced to some μA.

The IC switching behavior is Omnipolar, i.e. it can be switched on with either the North or South pole of a magnet.

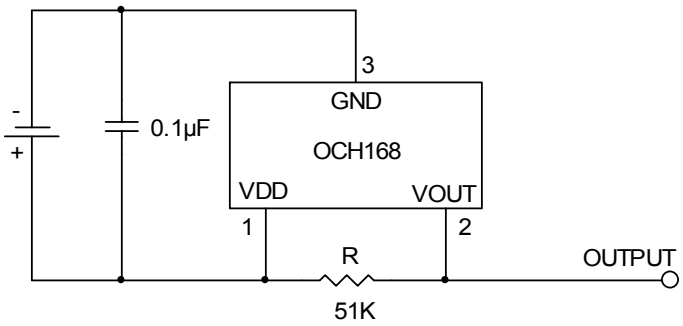
■ Features

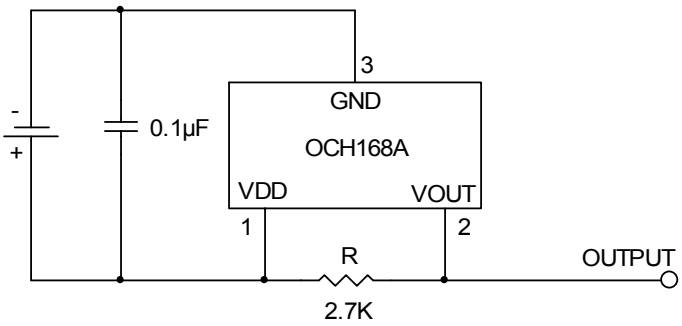
- Micro power design
- Operation with North or South pole(omni polar)
- 2.4V to 5.5V battery operation
- High sensitivity and high stability of the magnetic switching points
- High resistance to mechanical stress
- Digital output signal
- Good RF noise immunity
- -40℃ to 85℃ operating temperature
- Package: SOT23-3L/TSOT23-3L/SIP3/SC70M-3L

■ Applications

- Cellular Phone
- PDA
- Cordless Phone

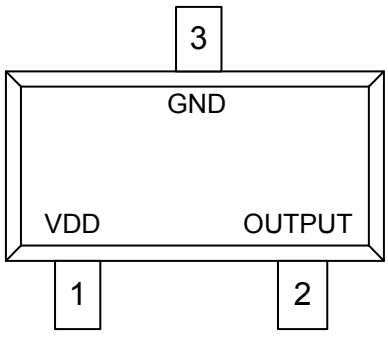
■ Typical Application



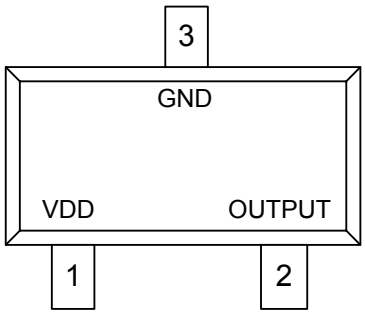


■ Pin Configuration

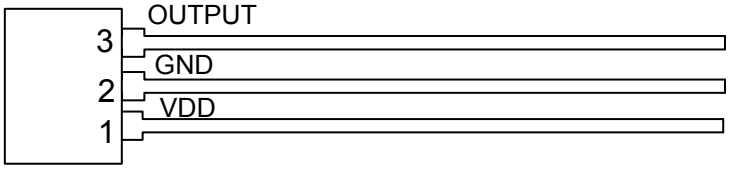
1) SOT23-3L



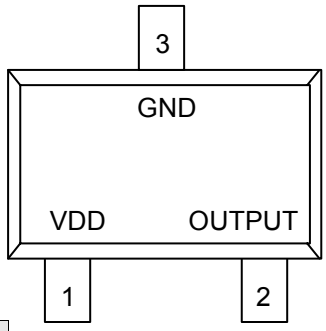
2) TSOT23-3L



3) SIP3

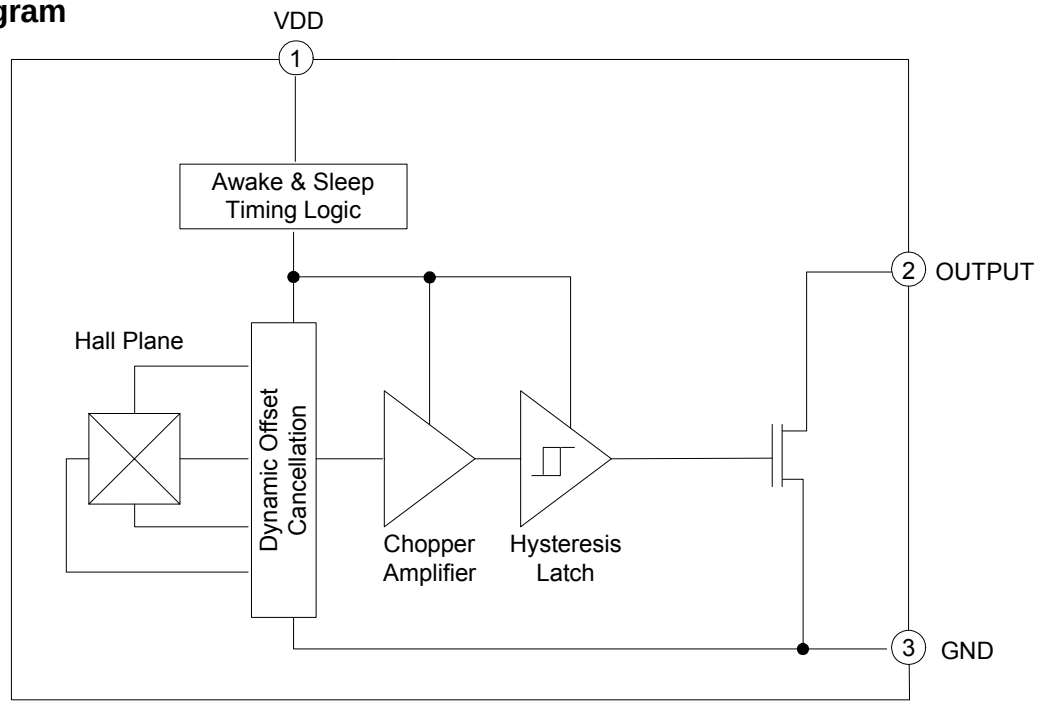


4) SC70M-3L



Symbol	Function
VDD	Supply Voltage
OUTPUT	Signal Output (Open Drain)
GND	Ground

■ Block Diagram



■ Absolute Maximum Ratings

Parameter	Symbol	Maximum	Unit
Supply Voltage	V_{DD}	5.5	V
Supply Current	I_{DD}	2.5	mA
Output Voltage	V_O	5.5	V
Output Current	I_O	1	mA
Operating Temperature Range	T_A	-40 to 85	℃
Junction Temperature	T_J	-40 to 150	℃
Storage Temperature	T_{STG}	-40 to 150	℃
Magnetic Flux Density	B	unlimited	mT
Power Dissipation	P_D	230	mW

Note: Stress above the listed absolute maximum rating may cause permanent damage to the device

■ Electrical Characteristics

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Averaged Supply Current	$I_{DD(AVG)}$			3[1)]	20	uA
Supply Current During Operating Time	$I_{DD(OP)}$			1.1[1)]	-	mA
Supply Current During Standby Time	$I_{DD(STB)}$			2.5[1)]	-	uA
Output Saturation Voltage	$V_{O(SAT)}$	I_O=1mA		0.1	0.3	V
Output Leakage Current	$I_{O(LEAK)}$			0.01	1	uA
Operating Time	T_{OP}			56		us
Standby Time	T_{STB}			140		ms
Duty Cycle	T_{OP} / T_{STB}			0.04		%

[1)] Operating voltage is 2.7V.

■ Operating Range

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage[2)]	V_{DD}	2.4	2.7	5.5	V
Output Voltage	V_O	-0.3	2.7	5.5	V
Ambient Temperature	T_A	-40	25	85	℃

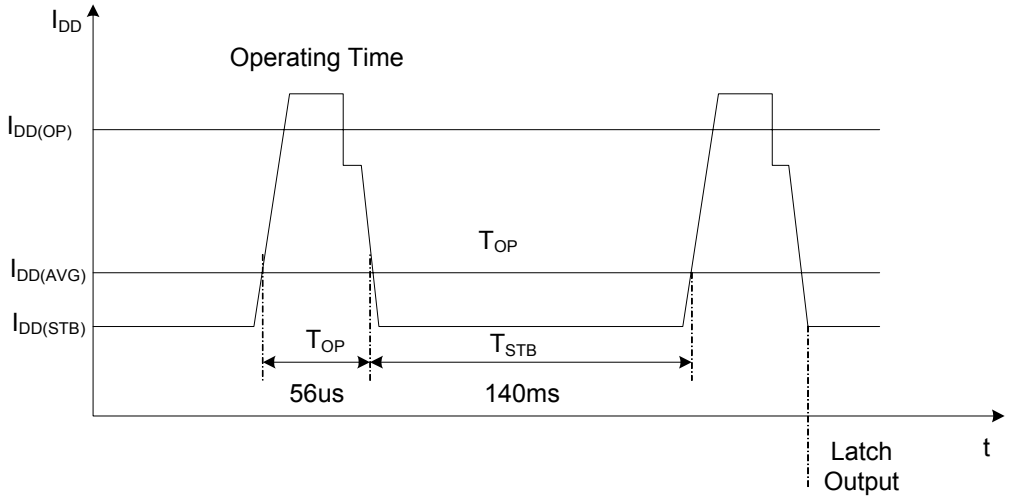
[2)]. A Ceramic Bypass Capacitor of 0.1uF at V_{DD} to GND is highly recommended.

■ Magnetic Characteristics

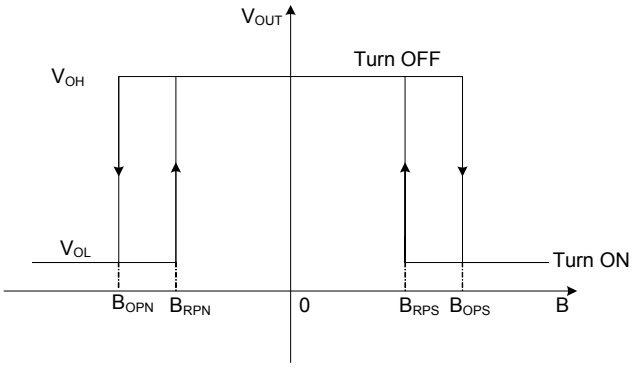
OCH168	If not other specified, typical characteristics apply at T_A = 25 °C and V_{DD} = 2.7 V				
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**
Operate Points (Output ON)	B_{OPS}	40	55	70	G
	B_{OPN}	-70	-55	-40	G
Release Points (Output OFF)	B_{RPS}	30	45	60	G
	B_{RPN}	-60	-45	-30	G
Hysteresis	B_{HYS}	5	10	15	G

OCH168A	If not other specified, typical characteristics apply at T_A = 25 °C and V_{DD} = 2.7 V				
Parameter	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**
Operate Points (Output ON)	B_{OPS}	15	25	35	G
	B_{OPN}	-35	-25	-15	G
Release Points (Output OFF)	B_{RPS}	7	15	25	G
	B_{RPN}	-25	-15	-7	G
Hysteresis	B_{HYS}	5	10	15	G

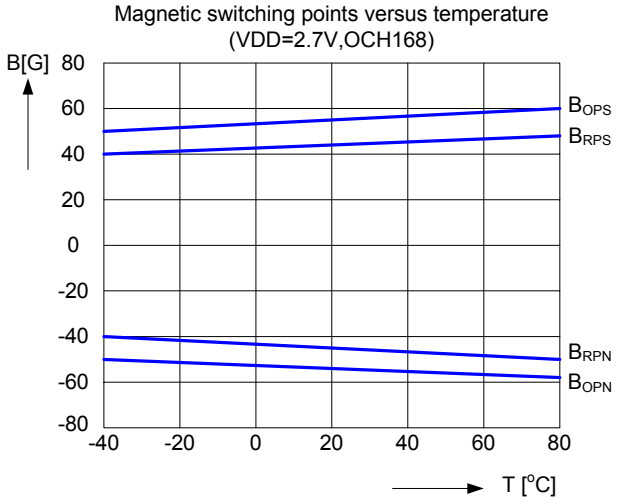
■ Timing Diagram

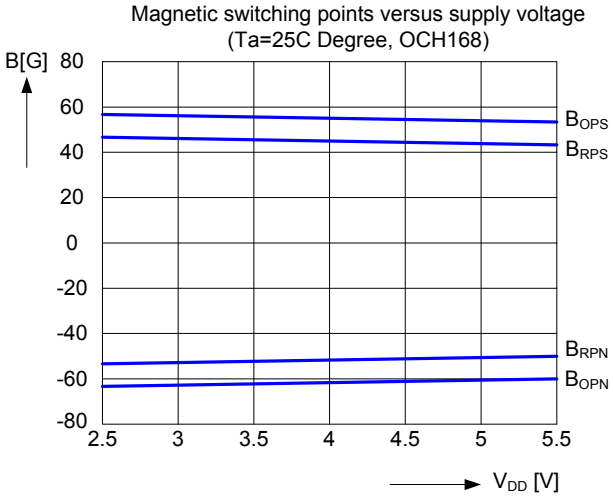


■ Output-Signal OCH168/OCH168A



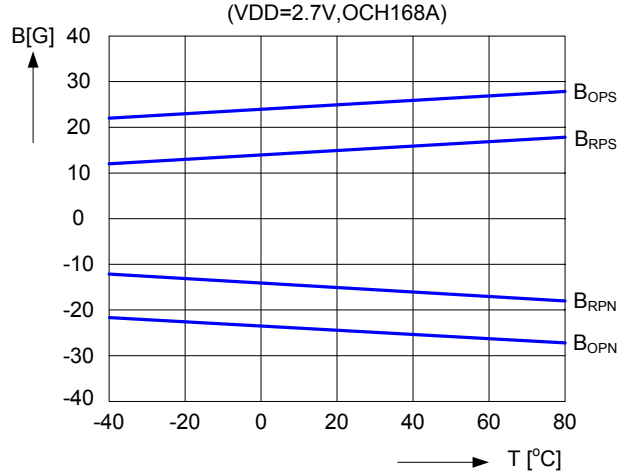
■ Typical Performance Characteristics



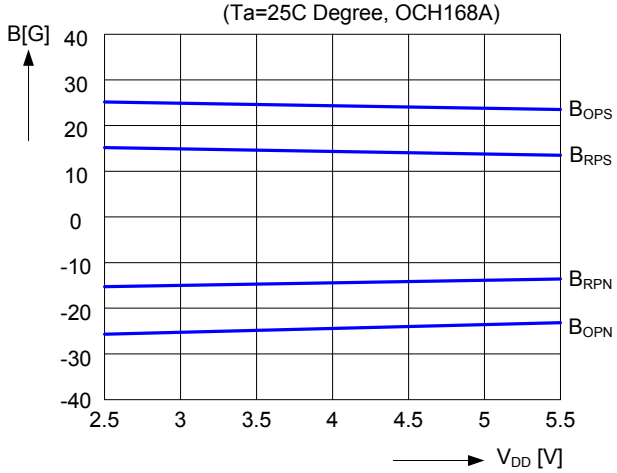


■ Typical Performance Characteristics(Continued)

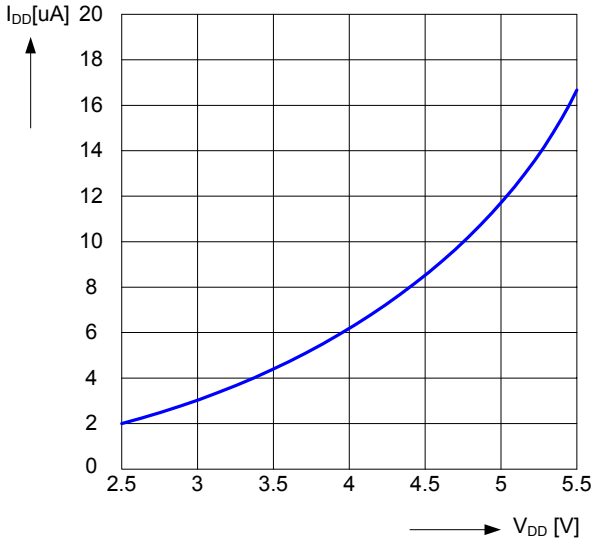
Magnetic switching points versus temperature
(VDD=2.7V,OCH168A)



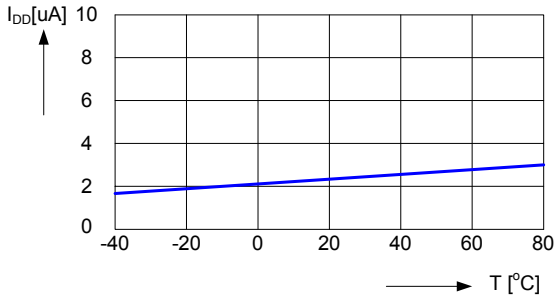
Magnetic switching points versus supply voltage
(Ta=25C Degree, OCH168A)



Average current versus supply voltage



Average current versus temperature (V_{DD}=2.7V)



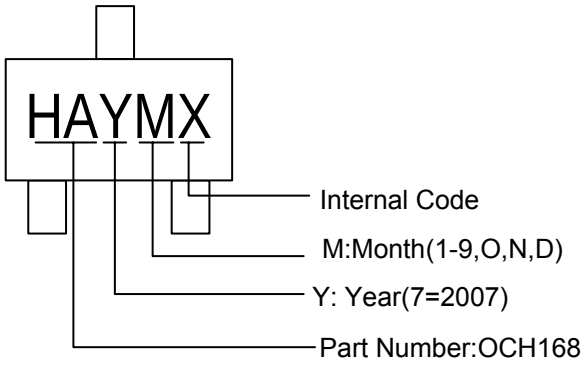
■ Ordering Information

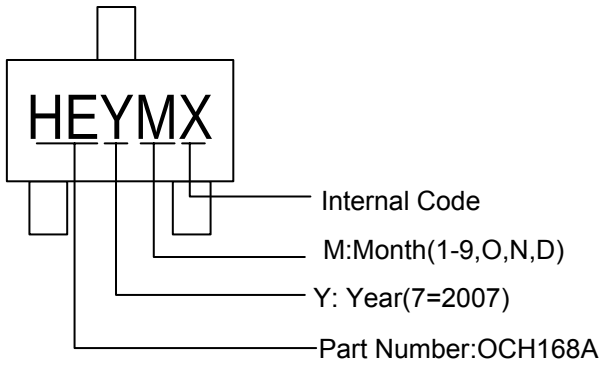
OCH168/OCH168AXXX

Package:	Packing:	Temperature Grade:
W: SOT23-3L	Blank: Tube or Bulk	D: -40~85℃
TW: TSOT23-3L	A: Tape & Reel	
M:SIP3		
C:SC70M		

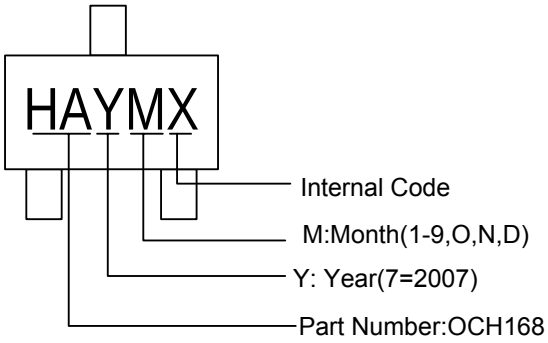
■ Marking Information

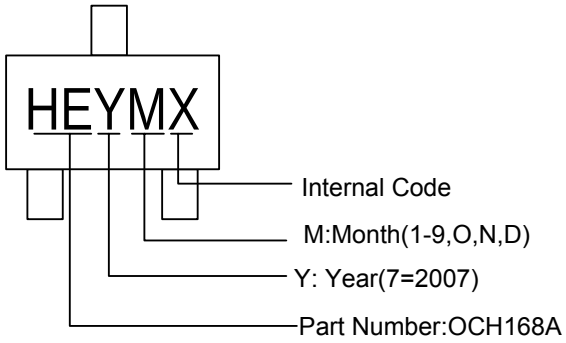
1) SOT23-3L



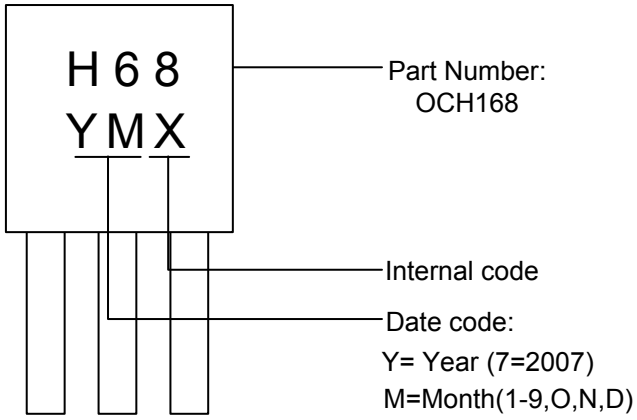


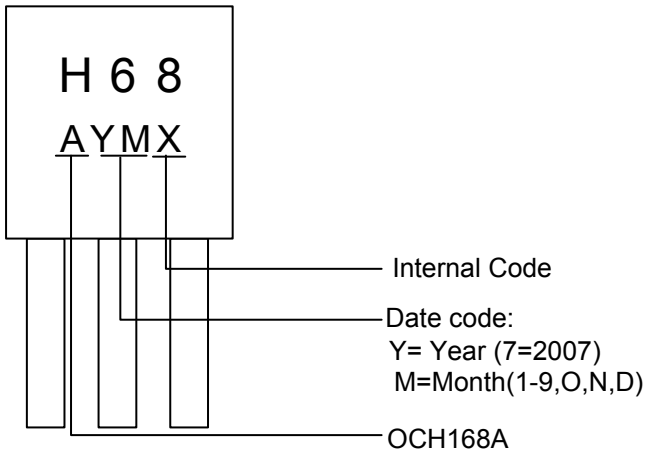
2) TSOT23-3L



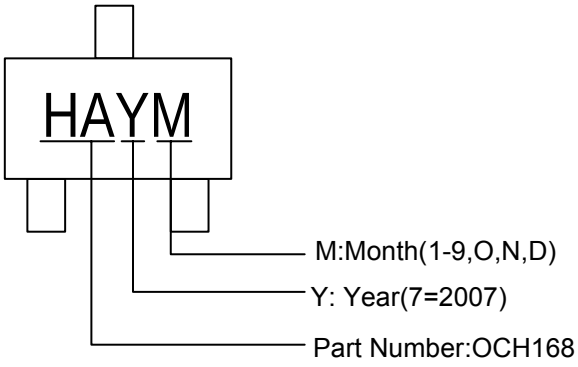


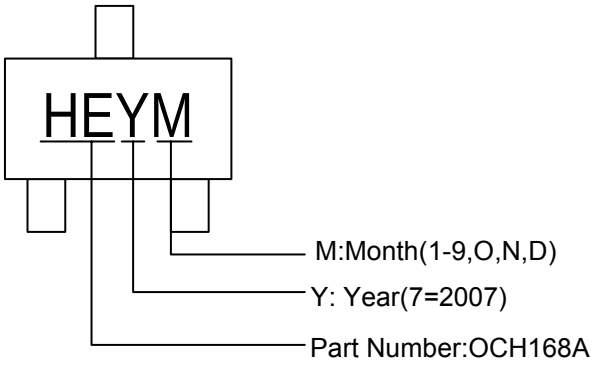
3) SIP3





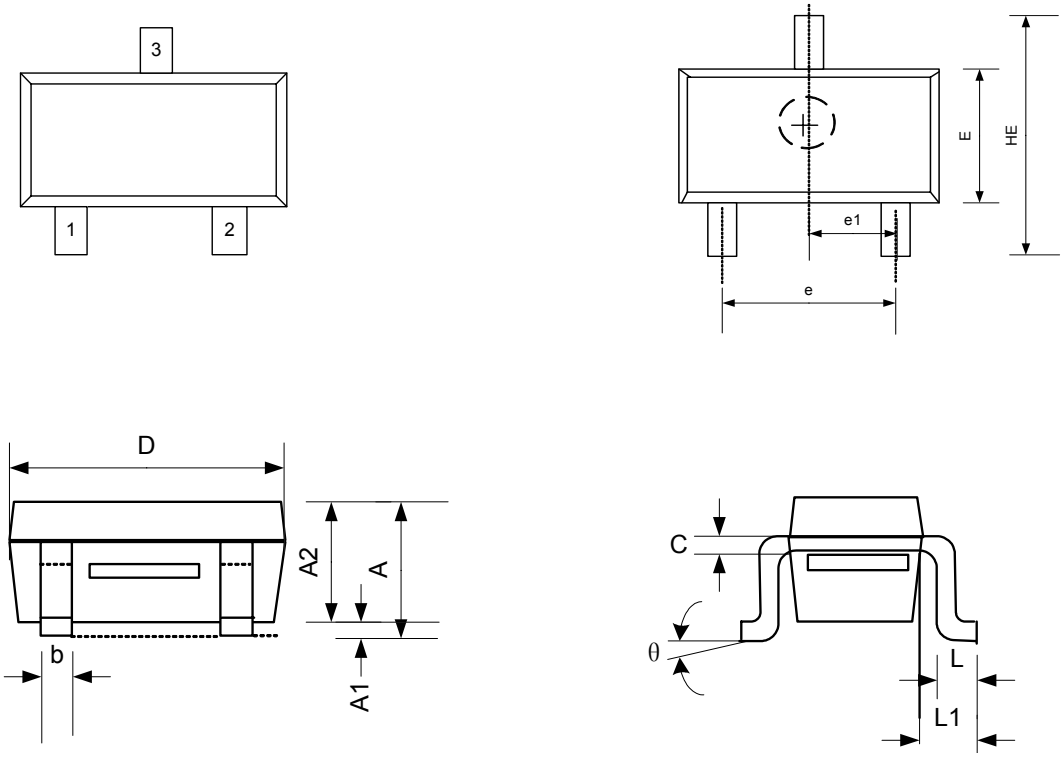
4) SC70M-3L


HAYM
M:Month(1-9,O,N,D)
Y: Year(7=2007)
Part Number:OCH168


HEYM
M:Month(1-9,O,N,D)
Y: Year(7=2007)
Part Number:OCH168A

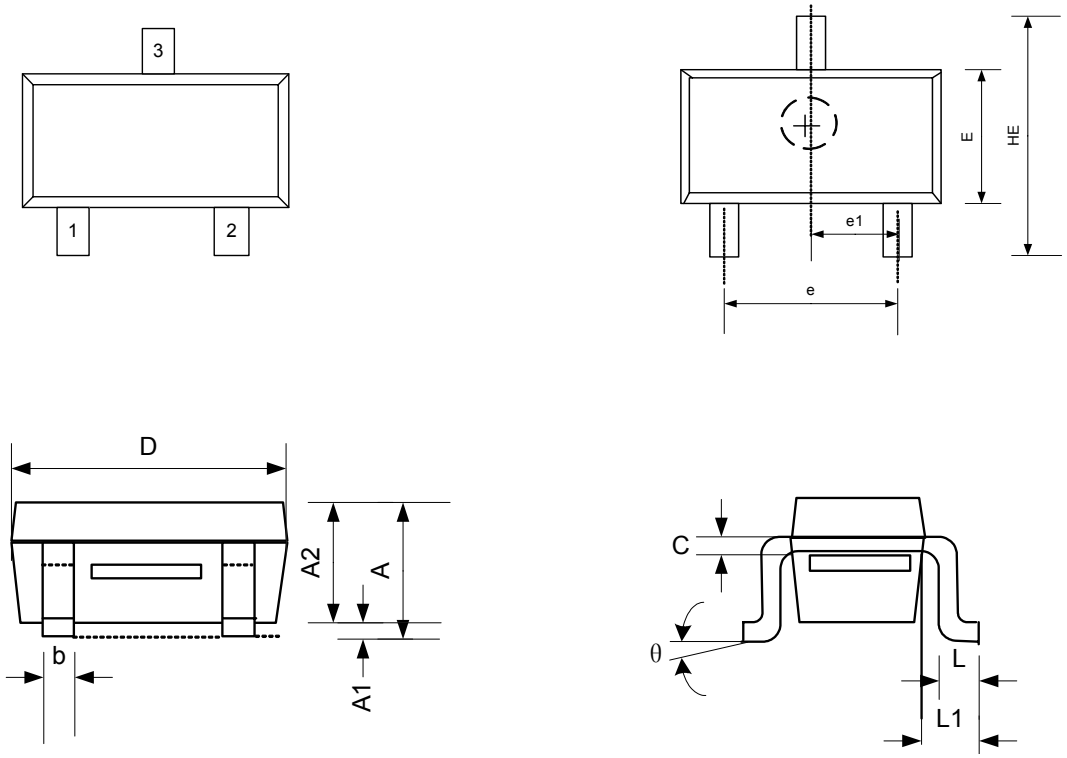
■ Package Information

1) SOT23-3L



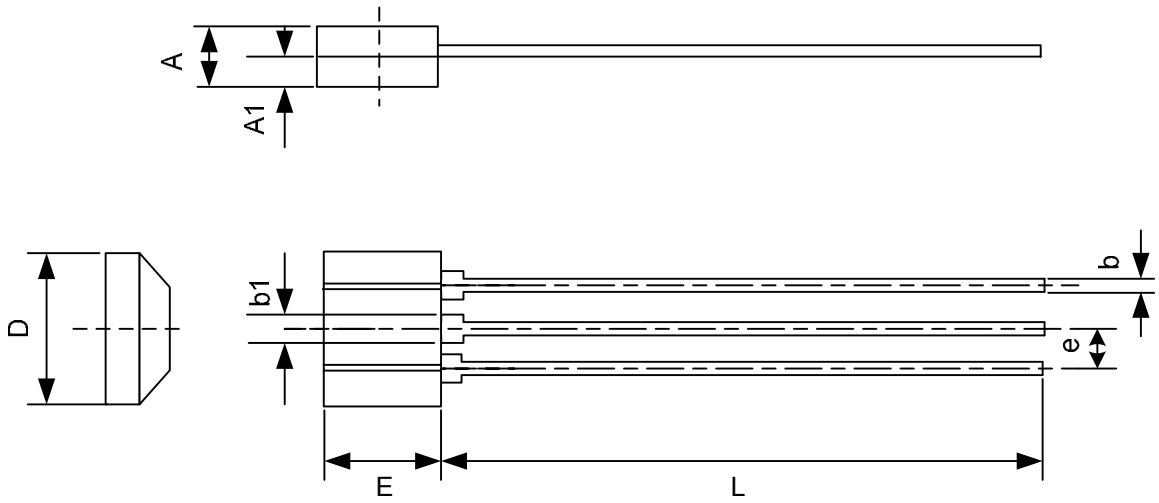
Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.45	-	-	0.057
A_1	-	-	0.15	-	-	0.006
A_2	0.90	1.15	1.30	0.035	0.045	0.051
b	0.30	-	0.50	0.012	-	0.020
C	0.08	-	0.22	0.003	-	0.009
D	2.90BSC			0.114BSC		
E	1.60BSC			0.063BSC		
e1	0.95BSC			0.037BSC		
e	1.90BSC			0.075BSC		
HE	2.80BSC			0.110BSC		
L	0.30	0.45	0.60	0.012	0.018	0.024
L1	0.60BSC			0.024BSC		
θ	0°	4°	8°	0°	4°	8°

2）TSOT23-3L



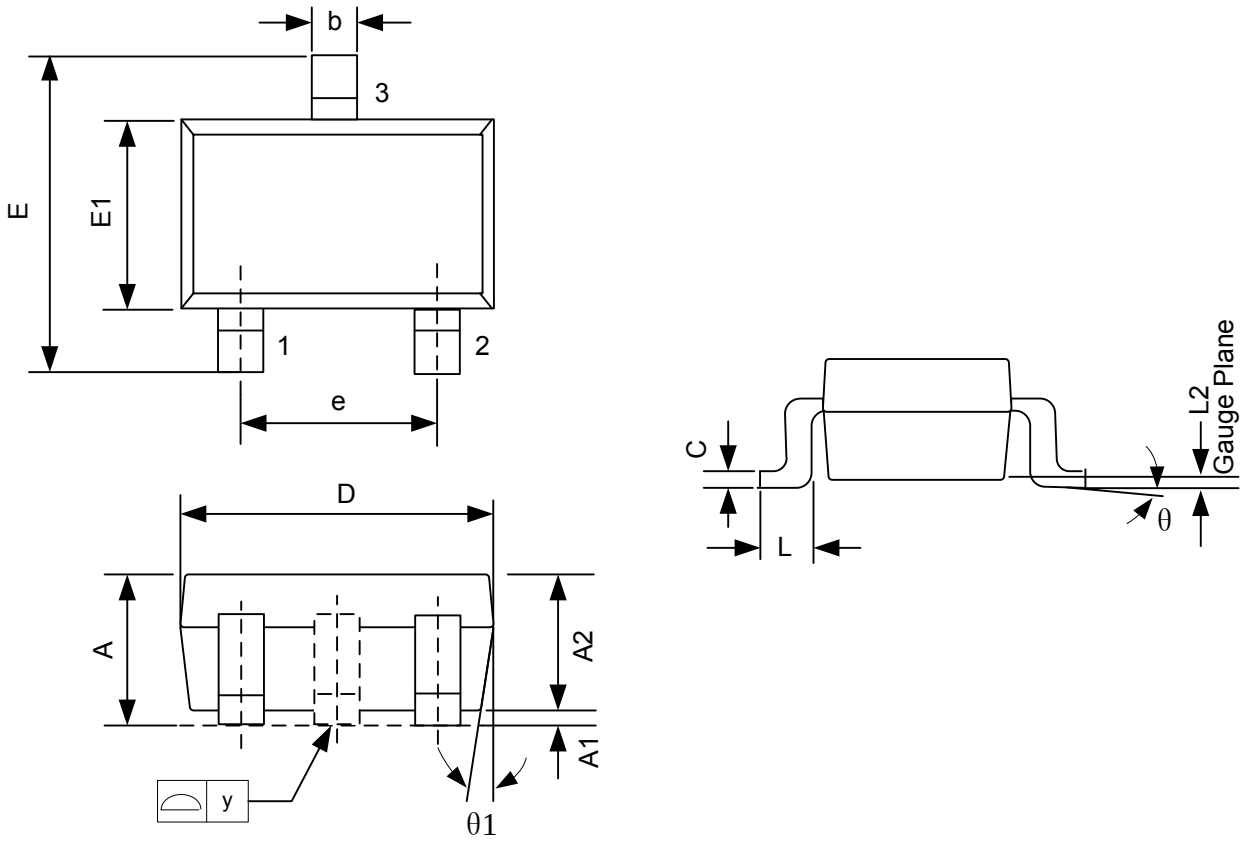
Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.750	-	0.800	0.030	-	0.032
A_1	0.025	-	0.050	0.001	-	0.002
A_2	0.700	0.750	0.775	0.028	0.030	0.031
b	0.350	-	0.500	0.014	-	0.020
C	0.100	-	0.200	0.004	-	0.008
D	2.800	2.900	3.000	0.112	0.116	0.120
E	1.500	1.600	1.700	0.060	0.064	0.068
e1	0.950BSC			0.038BSC		
e	1.900BSC			0.076BSC		
HE	2.600	2.800	3.000	0.104	0.112	0.120
L	0.370	0.450	0.600	0.015	0.018	0.024
L1	0.600REF			0.024REF		
θ	0°	4°	8°	0°	4°	8°

3）SIP3



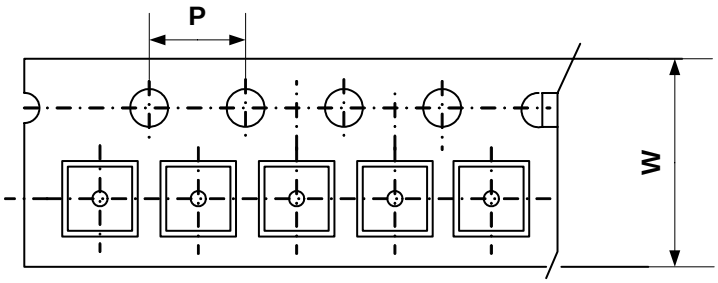
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.245	1.753	0.049	0.069
A1	0.750REF		0.030REF	
b	0.330	0.432	0.013	0.017
b1	0.406	0.508	0.016	0.020
D	3.962	4.216	0.156	0.166
E	2.870	3.124	0.113	0.123
L	13.60	15.60	0.535	0.614
e	1.270REF		0.050REF	

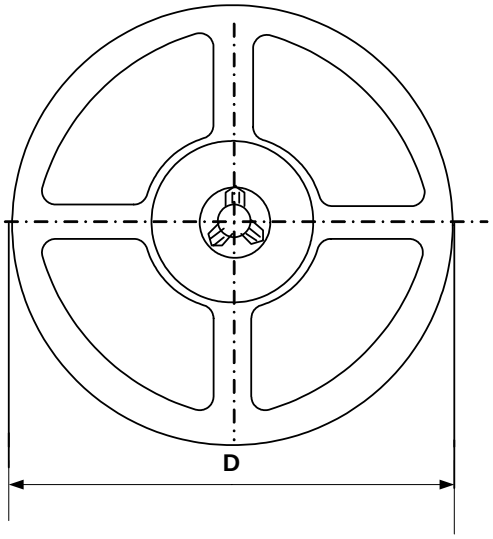
4) SC70M-3L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.80	-	1.10	0.031	-	0.043
A1	0.00	-	0.10	0.000	-	0.004
A2	0.70	0.90	1.00	0.028	0.035	0.039
b	0.25	-	0.40	0.010	-	0.016
C	0.08	-	0.22	0.003	-	0.009
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.80	2.10	2.40	0.071	0.083	0.094
E1	1.15	1.25	1.35	0.045	0.049	0.053
e	-	1.30	-	-	0.051	-
L	0.26	0.36	0.46	0.010	0.014	0.018
L2	-	0.15	-	-	0.006	-
y	-	-	0.10	-	-	0.004
θ	0°	4°	8°	0°	4°	8°
θ1	4°	-	12°	4°	-	12°

■ Packing Information





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
TSOT23-3L	8.0±0.1 mm	4.0±0.1 mm	180±1 mm	3000pcs
SIP3				1000pcs
SC70M-3L	8.0±0.3 mm	4.0±0.1 mm	180±1 mm	3000pcs

Note:
1. SIP3 Packing type: Bulk
2. Carrier Tape Dimension, Reel Size and Packing Minimum