Single Output Hall Effect Latch

❖ GENERAL DESCRIPTION

MA177 is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device is using HV BCD process includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

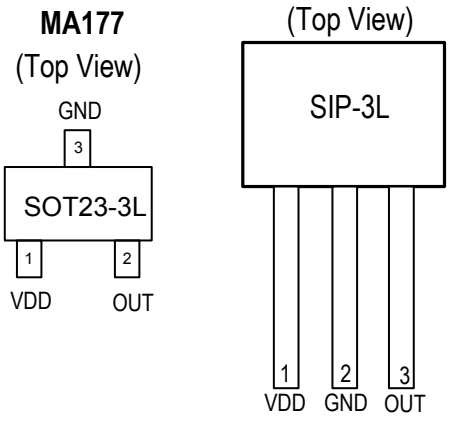
If a magnetic flux density larger than threshold Bop, OUT is turned on(low). The output state is held until a magnetic flux density reversal falls below Brp causing OUT to be turned off (high).

❖ FEATURES

- 3.3V to 26V DC operation voltage
- Temperature compensation
- Wide operating voltage range
- Open-Drain pre-driver
- 25mA maximum sinking output current.
- -40°C to 85°C operating temperature
- Low Profile SOT23-3L and SIP-3L Package(Green and Lead Free)

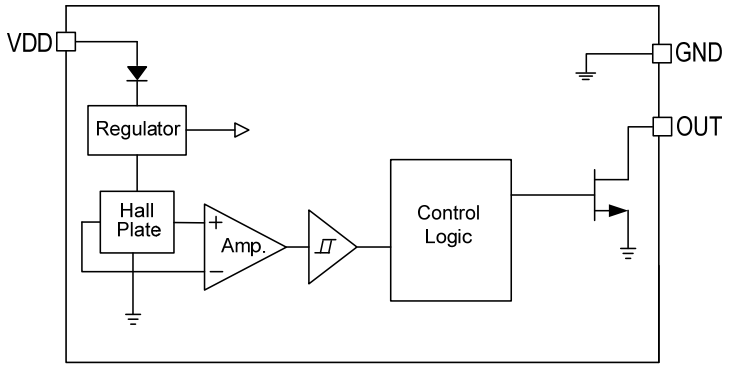
❖ PIN ASSIGNMENT

The package of MA177 are SOT23-3L and SIP-3L ; the pin assignment is given by:



Name	Description
VDD	Supply Voltage
OUT	Output
GND	Ground.

❖ BLOCK DIAGRAM



❖ RDER/MARKING INFORMATION

Order Information	Top Marking (SIP-3L)
MA177XXX Package Type P3: SIP-3L Packing Blank: Bag A : Taping	177 → Part number YWWX → ID code:internal WW:01~52 Year:6=2016
Order Information	**Top Marking (SOT23-3L)**
MA177 X X Package Type A: SOT23-3L Packing Blank: Bag A : Taping	H1 Y W X → ID Code: Internal Week: 01~26(A~Z) 27~52(a~z) Year : 6 = 2016

❖ A BSOLUTE MAXIMUM RATINGS (at T_A=25°C)

Characteristics		Symbol	Rating	Unit
Supply Voltage		V_{CC}	28	V
Reverse VCC Polarity Voltage		V_{RCC}	-28	V
Magnetic Flux Density		B	Unlimited	Gauss
Output Current	Continuous	I_O	25	mA
Power Dissipation		P_D	550	mW
Storage Temperature Range		T_{STG}	-65 to +150	°C
Thermal Resistance from Junction to case		θ_{JC}	49	°C/W
Thermal Resistance from Junction to ambient		θ_{JA}	227	°C/W
Ambient Temperature		T_A	-40 to 85	°C

❖ ELECTRICAL CHARACTERISTICS

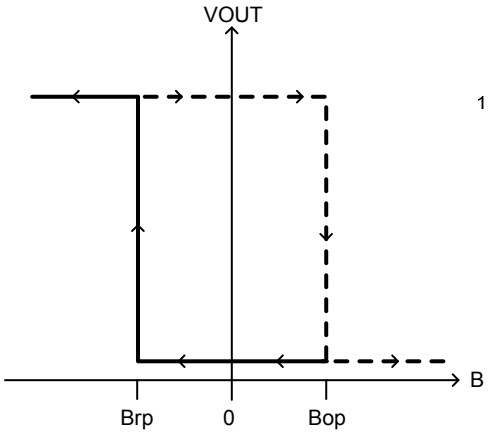
(V_{DD} = 12V, T_A = +25°C, unless otherwise noted.)

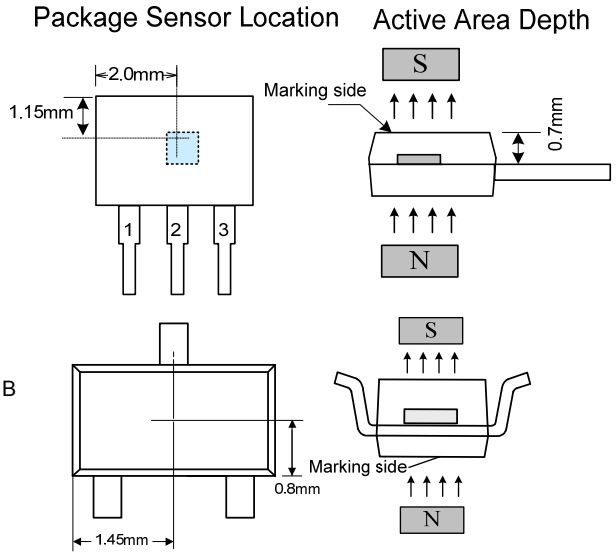
Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage	V_{DD}	Operating	3.3	-	26	V
Supply current	I_{DD}	Operating	-	3.0	4.5	mA
Output Leakage Current	I_{OFF}	V_{OUT}=12V	-	< 0.1	10	μA
Output Saturation Voltage	$Vds_{(sat)}$	I_{OUT}=20mA	-	0.3	-	V
Magnetic						(1mT=10 Gauss)
Operate Point	B_{OP}		5	35	60	Gauss
Release Point	B_{RP}		-60	-35	-5	Gauss
Hysteresis	B_{HYS}		-	70	-	Gauss

Driver output vs. magnetic pole(SIP3)

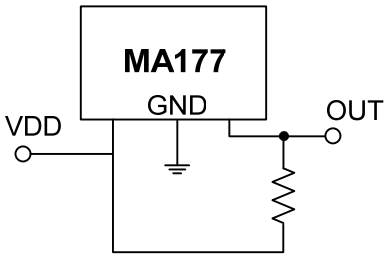
Characteristics	Test Conditions	DO
North pole	B < Brp	High
South pole	B > Bop	Low

Note: The magnetic pole is applied facing the branded side of the SIP3 package



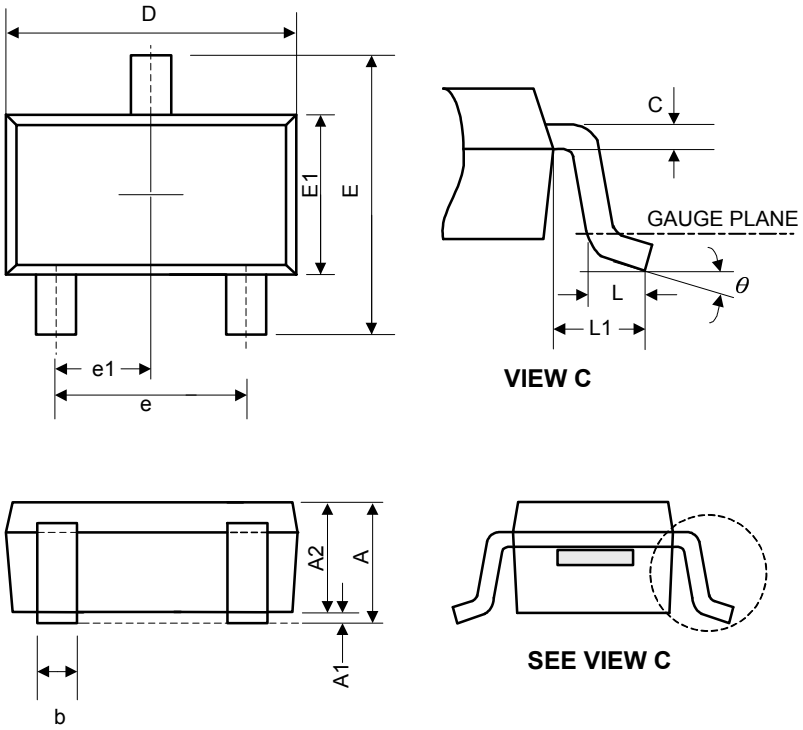


❖ TEST CIRCUIT



❖ PACKAGE OUTLINES

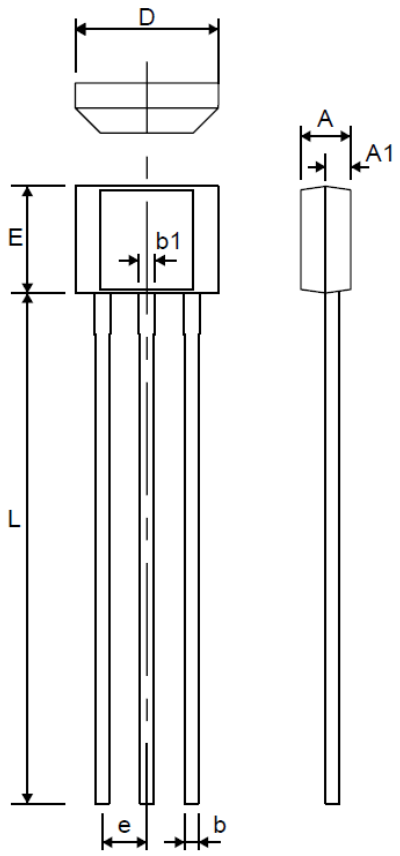
(1) SOT-23-3L



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.45	-	-	0.057
A1	0	0.08	0.15	-	-	0.006
A2	0.9	1.1	1.3	0.035	0.043	0.051
b	0.3	0.4	0.5	0.012	0.016	0.02
C	0.08	0.15	0.22	0.003	0.006	0.009
D	2.7	2.9	3.1	0.106	0.114	0.122
E	2.6	2.8	3	0.102	0.11	0.118
E1	1.4	1.6	1.8	0.055	0.063	0.071
L	0.3	0.45	0.6	0.012	0.018	0.024
L1	0.5	0.6	0.7	0.02	0.024	0.028
e	1.9 BSC			0.075 BSC		
e1	0.95 BSC			0.037 BSC		
θ	0°	4°	8°	0°	4°	8°

JEDEC outline: NA

1. SIP-3L



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.20	1.48	1.76	0.047	0.058	0.069
A1		0.75 REF.			0.030 REF.	
b	0.33	0.38	0.43	0.013	0.015	0.017
b1	0.40	0.45	0.50	0.016	0.018	0.020
D	3.90	4.10	4.30	0.154	0.161	0.169
e1		1.27 BSC			0.050 BSC	
E	2.80	3.00	3.20	0.110	0.118	0.126
L	13.60	14.60	15.60	0.535	0.575	0.614