

Ratio-metric Linear Hall Effect Sensor

❖ GENERAL DESCRIPTION

MA7918, a linear Hall-effect sensor, is composed of hall sensor, linear amplifier and output stage. The linear Hall sensor have an operating Temperature range of -40°C to +105°C, appropriate for commercial, consumer, and industrial environments.

The high sensitivity of Hall Effect sensor accurately tracks extremely small changes in magnetic flux density. The linear output voltage is set by the supply voltage and varies in proportion to the strength of the magnetic field.

The package style available provides magnetically optimized solutions for most applications.

❖ FEATURES

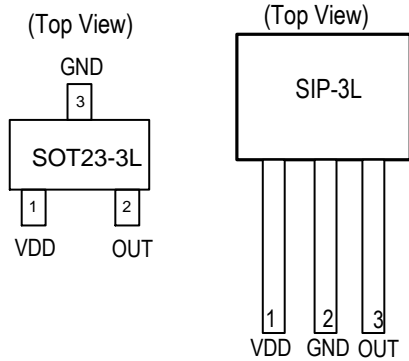
- Operating Voltage Range: 2.8V~5.5V
- Gauss Sensitivity : 1.0mV/G(VDD5V)
- High Linearity
- Linear output for circuit design flexibility
- Stable and accurate output
- Responds to either positive or negative gauss
- Superior Temperature Stability
- Low Profile SOT23-3L and SIP-3L(TO92S) Package(Green and Lead Free)

❖ APPLICATION

- Current sensing
- Motor control
- Position sensing
- Magnetic code reading

❖ PIN ASSIGNMENT

The package of MA7918 are SOT23-3L and SIP-3L ; the pin assignment is given by:

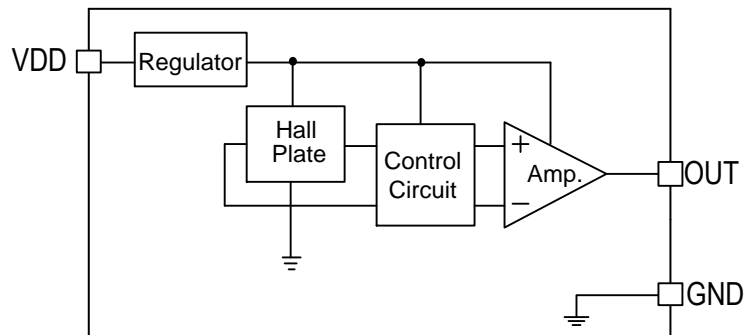


Name	Description
VDD	Supply Voltage
OUT	Output
GND	Ground.

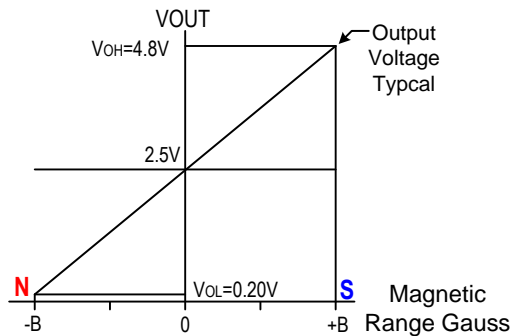
❖ RDER/MARKING INFORMATION

Order Information	Top Marking (SIP-3L)
<p>MA7918 XXX</p> <ul style="list-style-type: none"> Package: P3: SIP-3L Packing: Blank: Bag, A: Taping 	<p>7918</p> <p>YWWX → ID CODE : Internal use</p> <ul style="list-style-type: none"> WW:01~52 Year:9=2019
Order Information	Top Marking (SOT23-3L)
<p>MA7918 XXX</p> <ul style="list-style-type: none"> Package: A: SOT23L Packing: Blank: Bag, A: Taping 	<p>L C Y W X → ID Code: Internal</p> <ul style="list-style-type: none"> Week: 01~26(A~Z), 27~52(a~z) Year : 8 = 2018

❖ BLOCK DIAGRAM



❖ Transfer Characteristics($V_{DD}=5.0V$, Die top)



❖ ABSOLUTE MAXIMUM RATINGS (at $T_A=25^\circ C$)

Characteristics	Symbol	Rating	Unit
VDD Pin Voltage	V _{DD}	- 7 to 7V	V
Output Pin Voltage	V _{OUT}	- 0.3 to 7V	V
Magnetic Flux Density	B	Unlimited	Gauss
Output Current	I _O	20	mA
Storage Temperature Range	T _{STG}	-65 to +150	°C
Maximum Junction Temp	T _J	150	°C
Thermal Resistance from Junction to case(SIP3/SOT23)	θ_{JC}	49/410	°C/W
Thermal Resistance from Junction to ambient(SIP3/SOT23)	θ_{JA}	227/543	°C/W
Operating Temperature Range	T _O	-40 to 105	°C
Power Dissipation(SIP3/SOT23)	P _D	550/230	mW

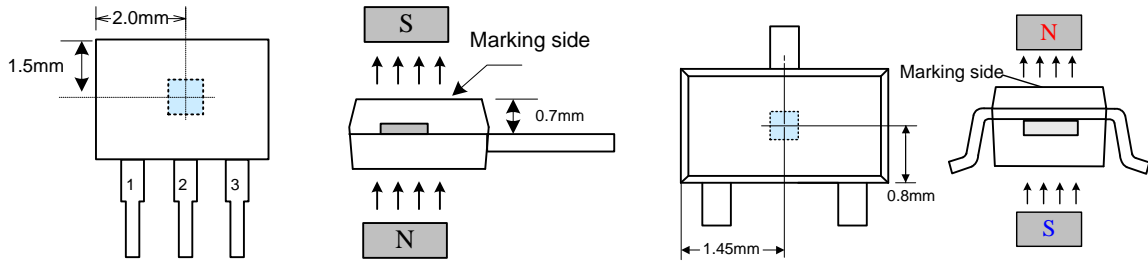
❖ ELECTRICAL CHARACTERISTICS

($V_{DD} = 5V$, $T_A = +25^\circ C$, unless otherwise noted.)

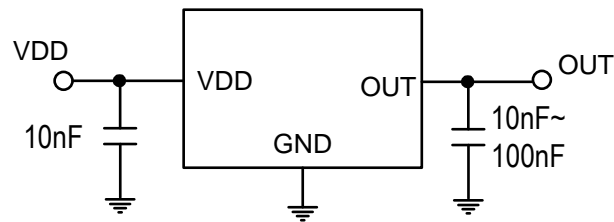
Characteristics	Symbol	Conditions	Min	Typ	Max	Units
Supply Voltage	V _{DD}	Operating	2.8	-	5.5	V
Supply current	I _{DD}	B=0 Gauss	-	4.0	5	mA
Output Current	I _O		-5	-	5	mA
Null Output voltage	V _{NULL}	B=0 Gauss	2.40	2.5	2.60	V
Output Voltage Span	V _{OS}		-	4.6	-	V
Linearity		% of Span		1.0		
Output voltage High	V _{OH}	VCC>=4V,I _O =-5mA	VCC-0.2	-	-	V
Output voltage Low	V _{OL}	VCC>=4V,I _O =5mA	-	-	0.2	V
Output voltage High	V _{OH}	VCC<4V,I _O =-5mA	VCC-0.3	-	-	V
Output voltage Low	V _{OL}	VCC<4V,I _O =5mA	-	-	0.3	V
Response Time	T _R	V _{null} to V _{OH} /V _{OL} ,No Load		100	200	μS
Sensitivity	S		0.75	1.0	1.25	mV/G
Output Resistance	R _{DSON}			20		Ω
ESD	HBM		3			KV

❖ SENSOR LOCATION

Package Sensor Location Active Area Depth



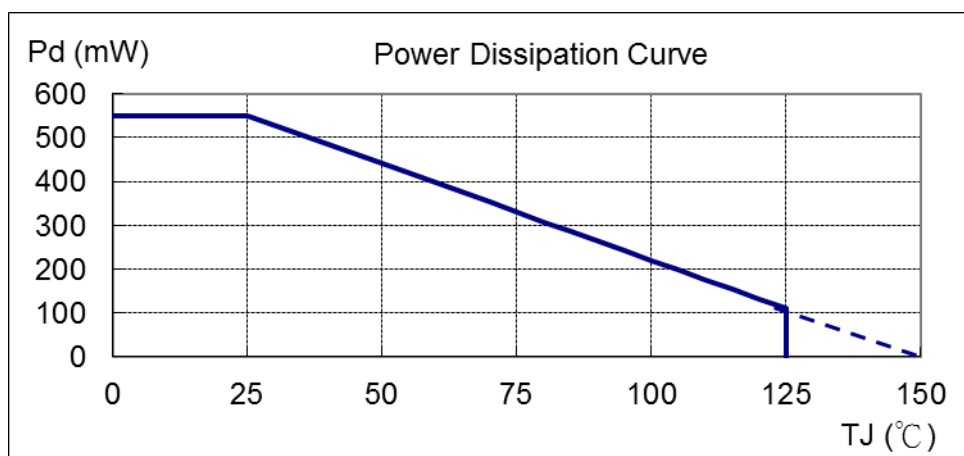
❖ TEST CIRCUIT



❖ PERFORMANCE CHARACTERISTICS

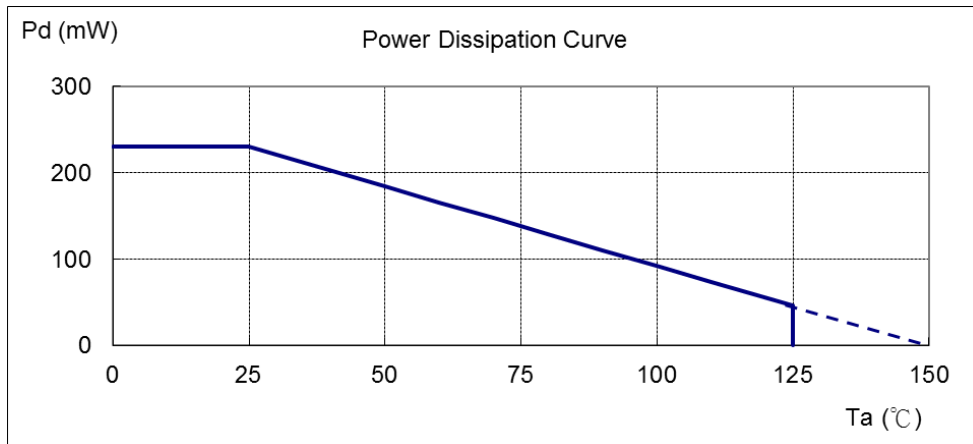
SIP-3L

T_A (°C)	25	50	60	70	80	85	90	95	100
Pd (mW)	550	440	396	352	308	286	264	242	220
T_A (°C)	105	110	115	120	125	130	135	140	150
Pd (mW)	198	176	154	132	110	88	66	44	0



SOT-23-3L

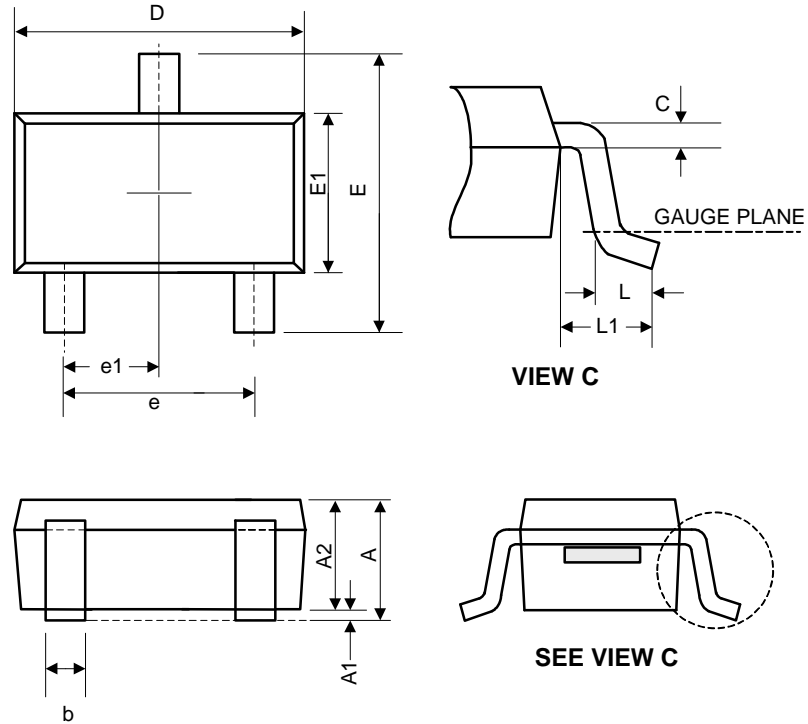
T_A (°C)	25	50	60	70	80	85	90	95	100
Pd (mW)	230	230	184	166	147	129	120	110	101
T_A (°C)	105	110	115	120	125	130	135	140	150
Pd (mW)	83	74	64	55	46	37	27	18	0



❖ PERFORMANCE CHARACTERISTICS

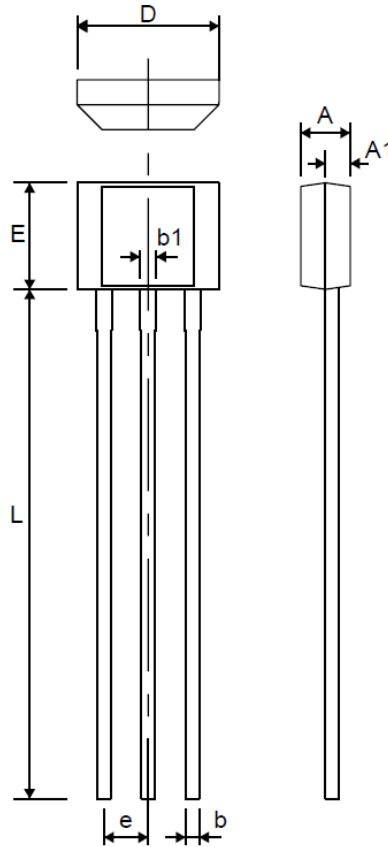
❖ PACKAGE OUTLINES

(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		

JEDEC outline: NA

2. 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