SH493 Ratio-metric Linear Hall Effect IC

SH493, a linear Hall-effect sensor, is composed of Hall sensor, linear amplifier and push-pull output stage. It has a wide operating temperature range -40℃ to 105℃, appropriate for consumer and industrial field.

Features

- Various sensitivity line up: 40mV/mT～130mV/mT
- Ratio-metric output
- Cost competitive
- Robust ESD performance

Typical Application

- Position sensing
- Current sensing
- Motor control

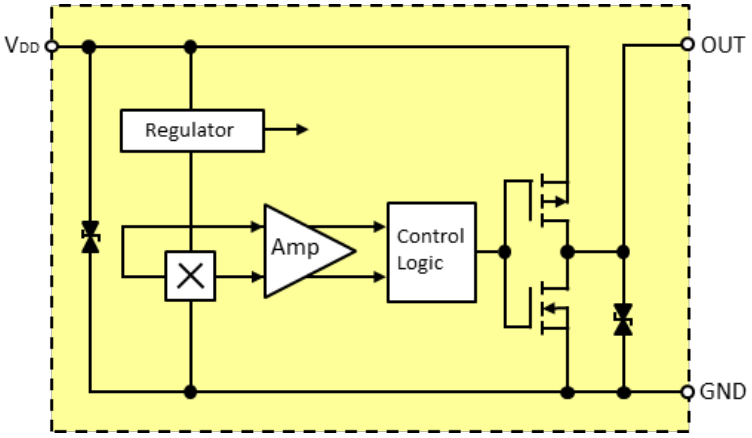
Order Information

Order No.	Parts No.	Sensitivity	Temperature	Package	—	Sorting
SH493AIUA	SH493	A	I	UA		
SH493BIUA	SH493	B	I	UA		
SH493CIUA	SH493	C	I	UA		
SH493DIUA	SH493	D	I	UA		
SH493AIUA-T	SH493	A	I	UA	—	T
SH493BIUA-T	SH493	B	I	UA	—	T
SH493CIUA-T	SH493	C	I	UA	—	T
SH493DIUA-T	SH493	D	I	UA	—	T
SH493AISO	SH493	A	I	SO		
SH493BISO	SH493	B	I	SO		
SH493CISO	SH493	C	I	SO		
SH493DISO	SH493	D	I	SO		
SH493AISO-T	SH493	A	I	SO	—	T
SH493BISO-T	SH493	B	I	SO	—	T
SH493CISO-T	SH493	C	I	SO	—	T
SH493DISO-T	SH493	D	I	SO	—	T
SH493AISQ	SH493	A	I	SQ		
SH493BISQ	SH493	B	I	SQ		
SH493CISQ	SH493	C	I	SQ		
SH493DISQ	SH493	D	I	SQ		
SH493AISQ-T	SH493	A	I	SQ	—	T
SH493BISQ-T	SH493	B	I	SQ	—	T
SH493CISQ-T	SH493	C	I	SQ	—	T
SH493DISQ-T	SH493	D	I	SQ	—	T

Legend:

Sensitivity Code:	A (40mV/mT), B (70mV/mT), C (100mV/mT), D (130 mV/mT)
Temperature Code:	I (-40℃～105℃)
Package Code:	UA (TO-92S), SO (SOT23), SQ (QFN2020-3)
Sorting Code:	Brank (Normal), T (Trimmed)

Functional Block Diagram



Absolute Maximum Ratings (T_A=25℃)

Parameter	Symbol	Value Min	Value Max	Unit
Supply Voltage	V_{DD}	-0.5	8	V
Output Voltage	V_{OUT}	-	8	V
Output Current	I_{OUT}	-	5	mA
Operating Temperature Range (I)	T_A	-40	105	℃
Storage Temperature Range	T_S	-55	150	℃
Maximum Junction Temperature	T_J	-	150	℃
Power Dissipation (UA/SO/SQ)	P_D	-	606/230/230	mW

Electrical & Magnetic Characteristics (T_A=25℃, V_{DD}=5V)

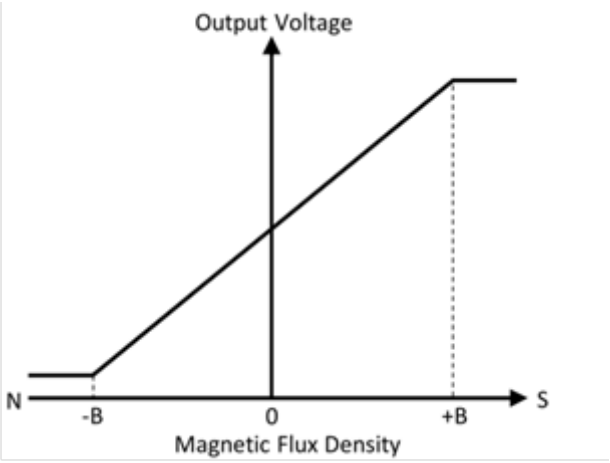
Parameter	Test Condition	Symbol	Value Min	Value Typ	Value Max	Unit
Supply Voltage		V_{DD}	4.5	-	5.5	V
Consumption Current	B=0mT	I_{DD}	-	3.3	5	mA
Output Voltage Span		V_{OS}	-	4.8	-	V
Power-ON Time		t_{ON}	-	50	-	μs
Output Switching Frequency		f_{BW}	3	-	-	kHz
Null Ratio-metric Error		RE_{NULL}	-	±1.5	-	%
Sensitivity Ratio-metric Error		RE_{SENS}	-	±1.5	-	%
Linearity		LIN	-	±1.5	-	%

Electrical & Magnetic Characteristics (T_A=25℃, V_{DD}=5V) *cont'd*

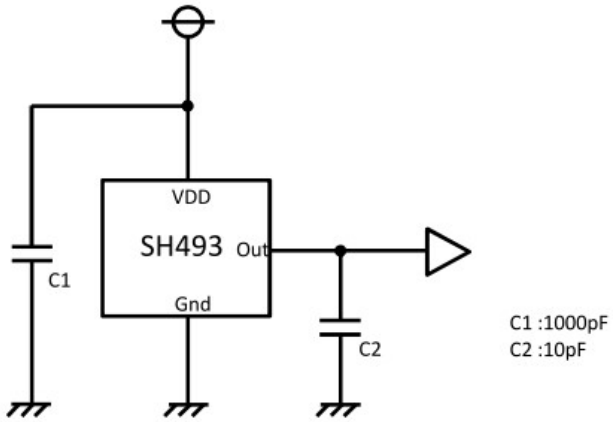
Parameter		Test Condition	Symbol	Value Min	Value Typ	Value Max	Unit
Null Output Voltage (Trimmed)		B=0mT	V_{NULL}	2.375 (2.475)	2.5	2.625 (2.525)	V
Sensitivity (Trimmed)	SH493A		SENS	36 (38)	40	44 (42)	mV/mT
	SH493B		SENS	63 (66.5)	70	77 (73.5)	mV/mT
	SH493C		SENS	90 (95)	100	110 (105)	mV/mT
	SH493D		SENS	117 (123.5)	130	143 (136.5)	mV/mT
Electro-static Discharge		HBM		4	-	-	kV

Magnetic Pole Direction

Package	The magnetic pole facing the marking surface where the output voltage increases
All	S-pole

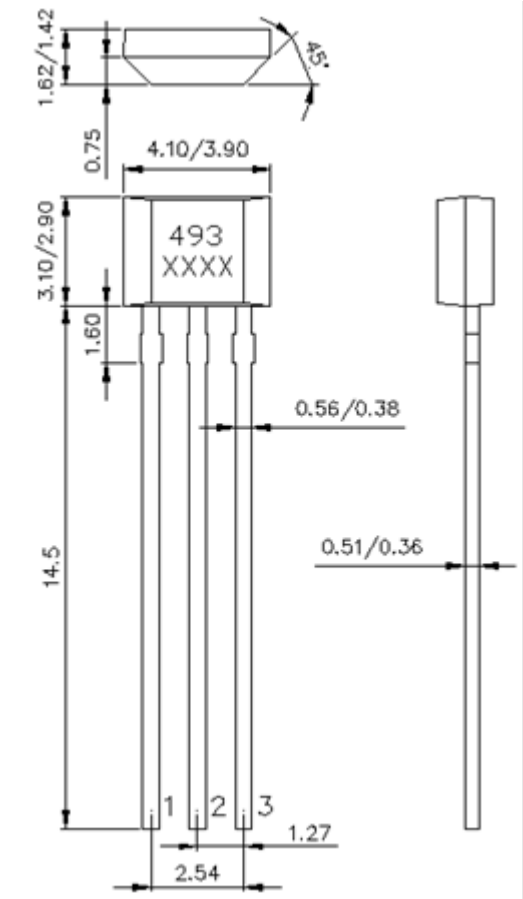


Typical Application Circuit

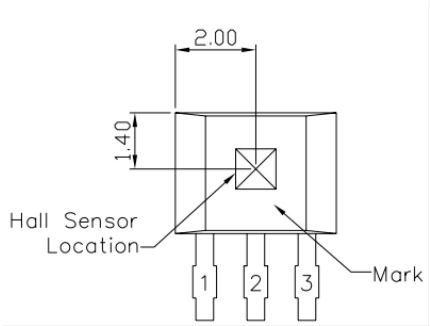


Sensor Location, Package Dimension and Marking

UA-package: TO92S



Hall Sensor Location

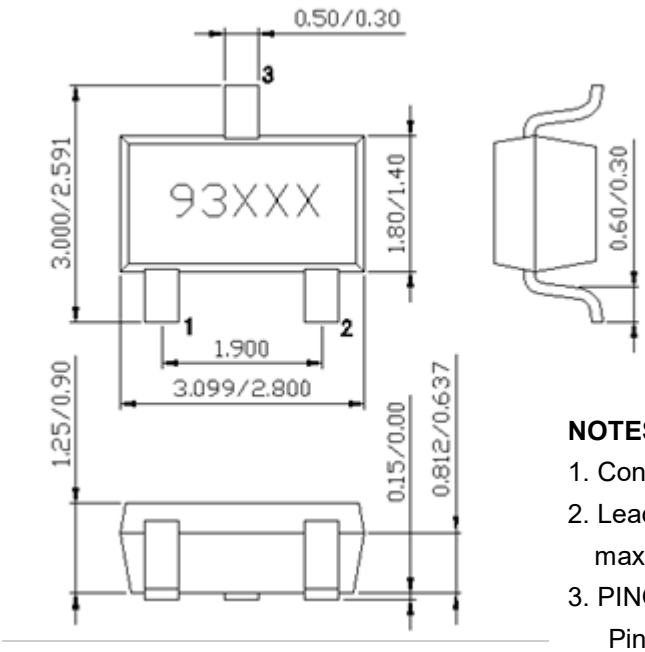


NOTES:

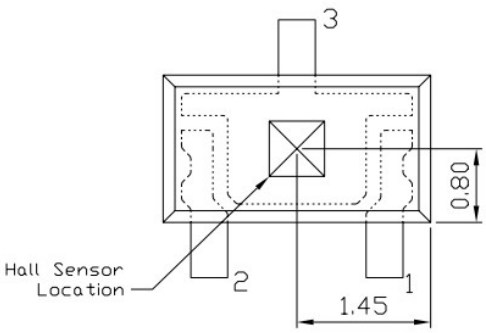
1. Controlling dimension: mm
2. Leads must be free of flash and plating voids.
3. Do not bend leads within 1 mm of lead to package interface.
4. PINOUT:

Pin 1	V_{DD}
Pin 2	GND
Pin 3	Output

SO-package: SOT23



Hall Sensor Location
(Bottom view)

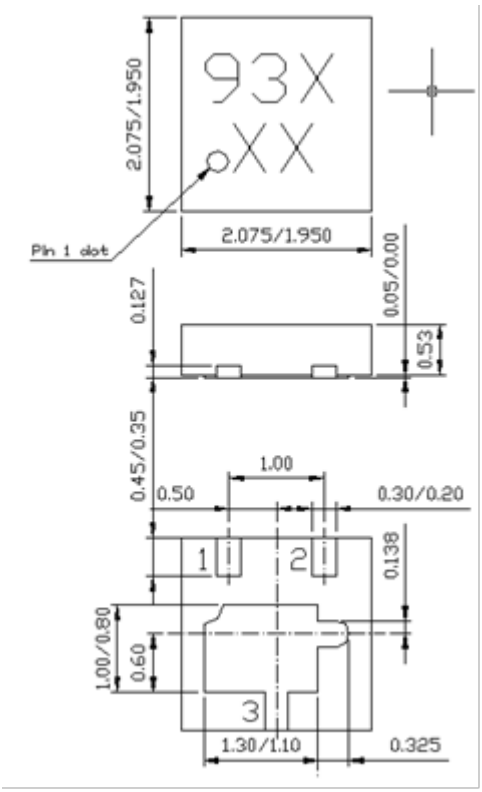


NOTES:

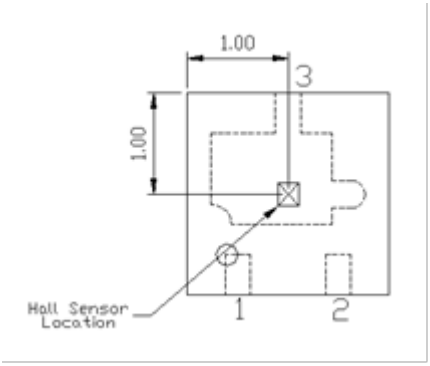
1. Controlling dimension: mm
2. Lead thickness after solder plating will be 0.254mm maximum.
3. PINOUT:

Pin 1	V_{DD}
Pin 2	Output
Pin 3	GND

SQ-package: QFN2020-3



Hall Sensor Location
(Top view)



NOTES:

1. Controlling dimension: mm
2. Chip rubbing will be 10mil maximum.
3. PINOUT:

Pin 1	V_{DD}
Pin 2	Output
Pin 3	GND