

SH253 High Sensitivity CMOS Omni-polar Hall Effect Switch

SH253 is a high sensitivity omni-polar Hall-effect switch designed in advanced CMOS technology. The following on a single silicon chip: voltage regulator, ESD protection Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, open-drain output. Superior high-temperature performance is made possible through a dynamic offset cancellation that utilizes chopper-stabilization.

Features

- High sensitivity (3mT typ.)
- Stable temperature characteristics
- Good ESD protection (HBM +/-4kV min.)

Typical Applications

- Solid-state switch
- Lid close sensor
- Speed sensing
- Position sensing
- Revolution counting
- Safety Key

Order Information

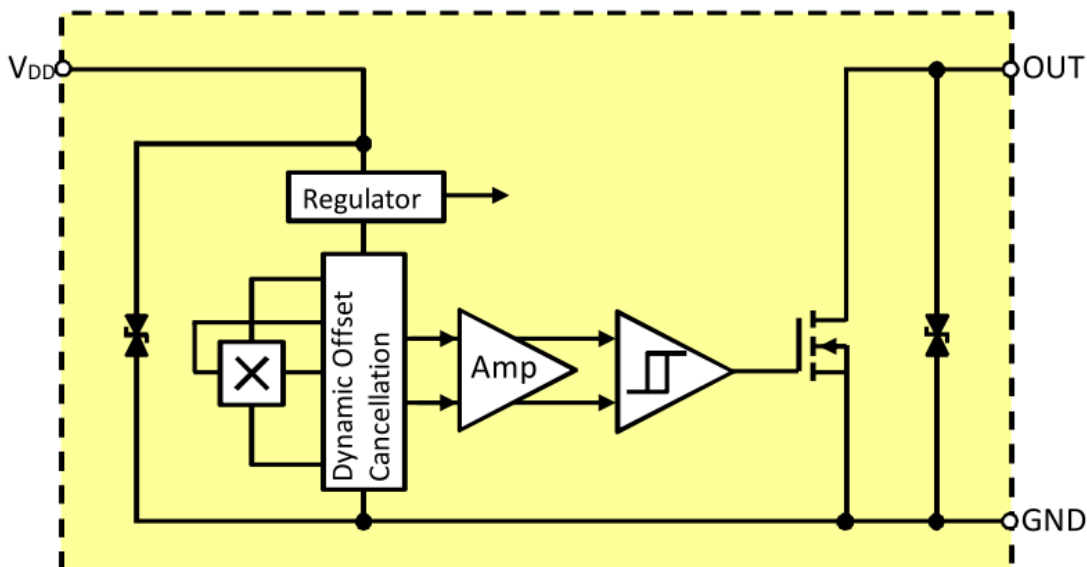
Order No.	Part No.	Temperature	Package	Packing
SH253EUA	SH253	E	UA	
SH253ESO-TR	SH253	E	SO	— TR

Legend:

Temperature Code: E (-40°C~85°C)

Package Code: UA (TO92S), SO (SOT23)

Packing Code: Brank (Balk, 500pcs/Bag), TR (Tape & Reel, 3,000pcs/Reel)

Functional Block Diagram


Absolute Maximum Ratings ($T_A=25^\circ\text{C}$)

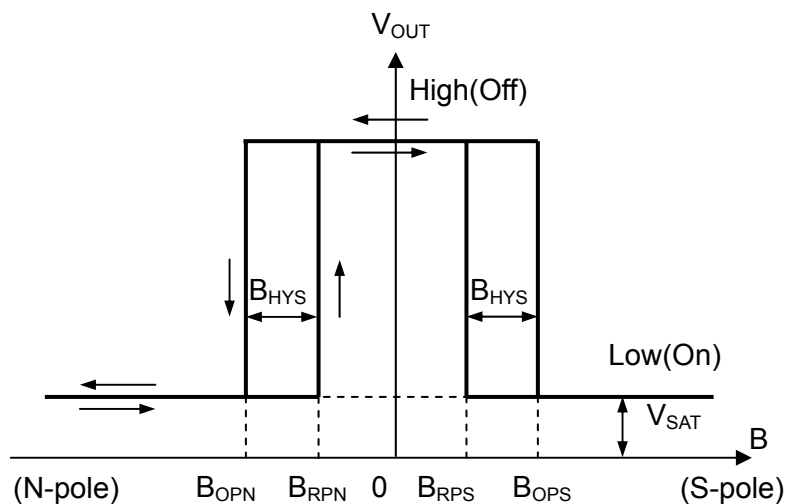
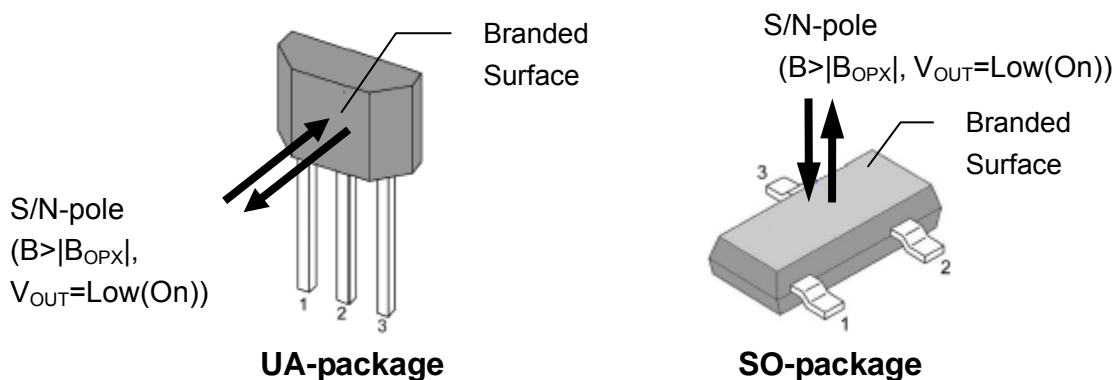
Parameter	Symbol	Value		Unit
		Min	Max	
Supply Voltage	V_{DD}	-0.3	7	V
Output Voltage	V_{OUT}	-0.3	6	V
Output Current	I_{SINK}	-	25	mA
Operating Temperature Range (E)	T_A	-40	85	$^\circ\text{C}$
Storage Temperature Range	T_S	-55	150	$^\circ\text{C}$
Maximum Junction Temperature	T_J		150	$^\circ\text{C}$
Power Dissipation (UA/SO)	P_D		606/230	mW

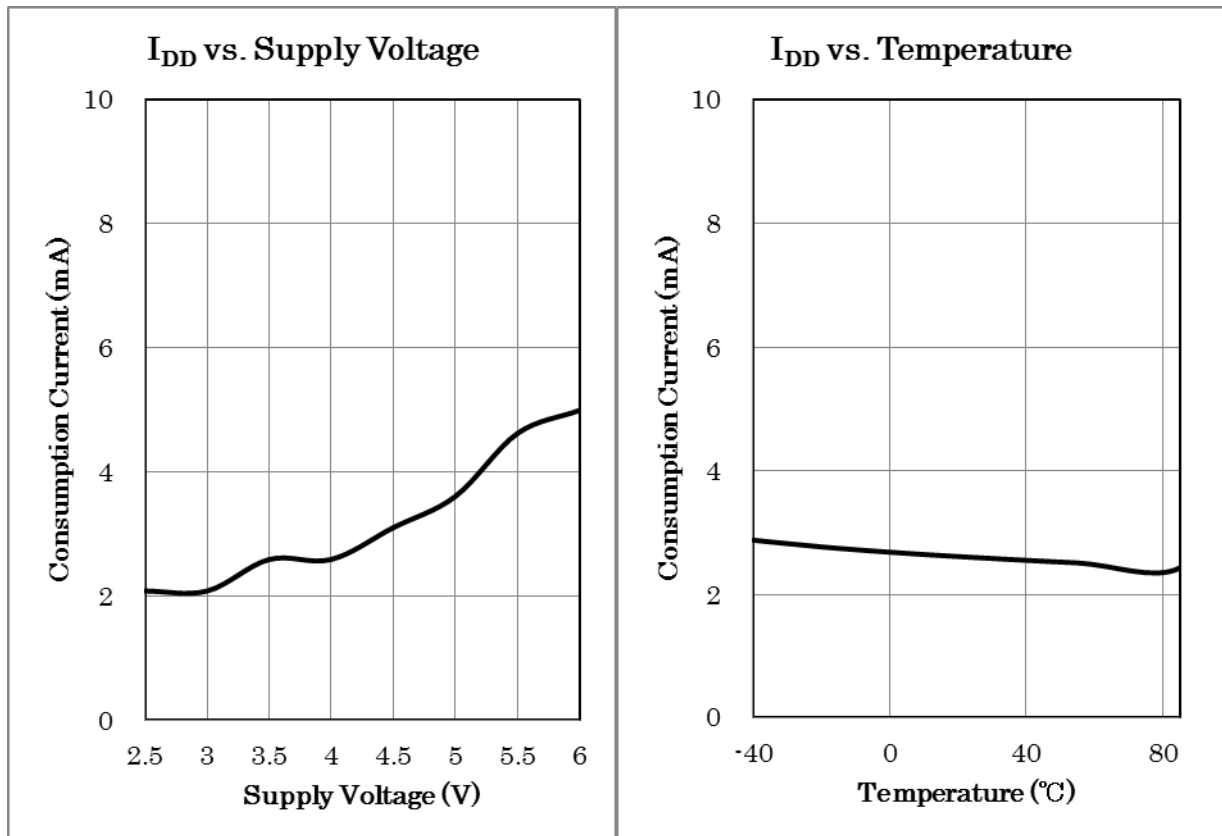
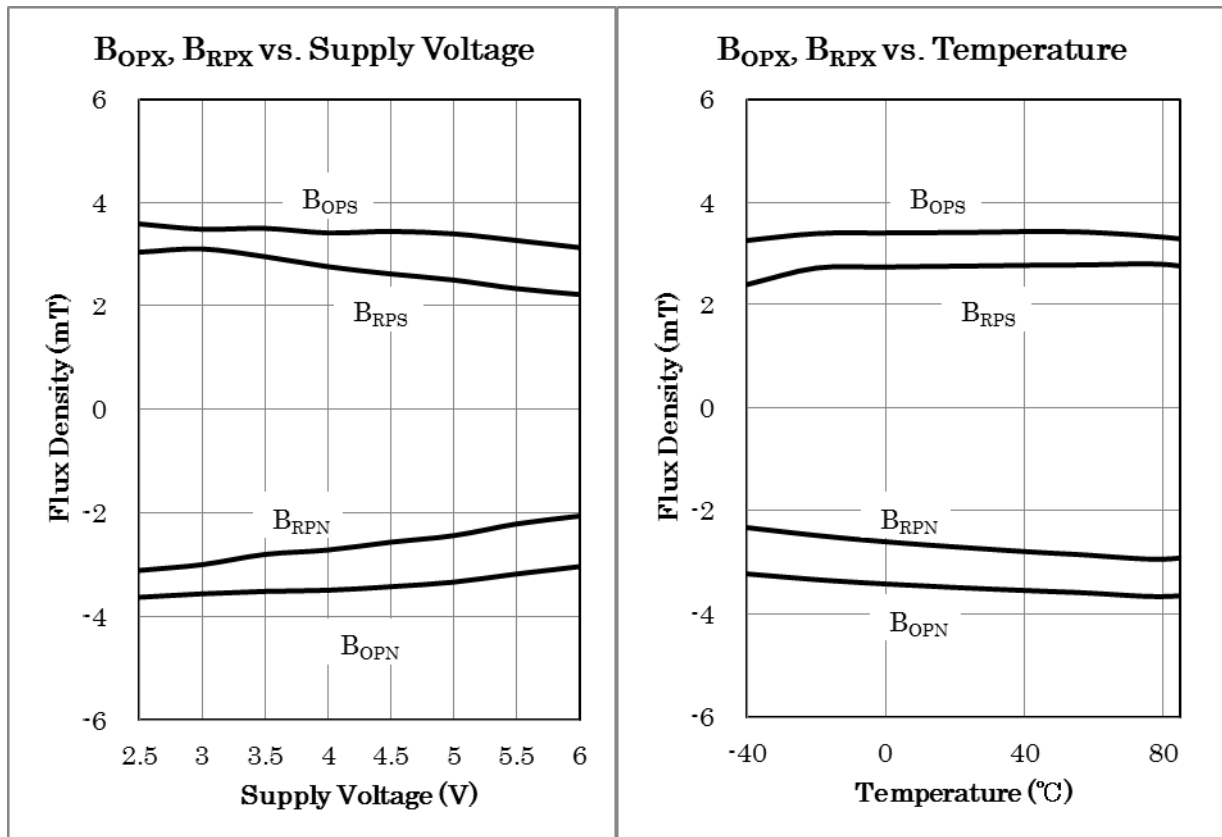
Electrical Characteristics ($T_A=25^\circ\text{C}$, $V_{DD}=5\text{V}$)

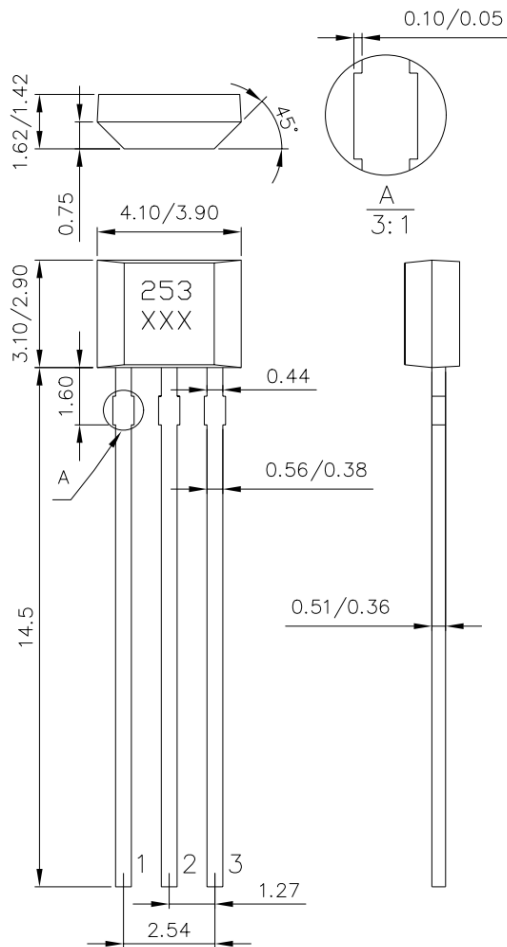
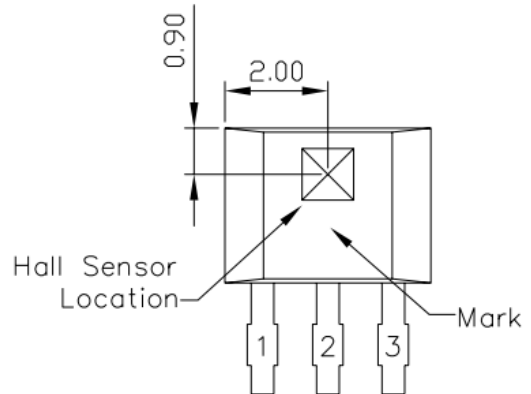
Parameter	Test Condition	Symbol	Value			Unit
			Min	Typ	Max	
Supply Voltage		V_{DD}	2.5	-	6	V
Consumption Current	$V_{OUT}=\text{High}$	I_{DD}	-	2.6	6	mA
Output Saturation Voltage	$I_{SINK}=10\text{mA}$, $V_{OUT}=\text{Low}$	V_{SAT}	-	-	0.4	V
Output Leakage Current	$V_{OUT}=\text{High}$ (5V)	I_{LEAK}	-	-	10	μA
Output Rise Time	$R_L=10\text{k}\Omega$, $C_L=20\text{pF}$	t_R	-	-	0.45	μs
Output Fall Time	$R_L=10\text{k}\Omega$, $C_L=20\text{pF}$	t_F	-	-	0.45	μs
ESD	HBM	-	4	-	-	kV

Magnetic Characteristics ($T_A=25^\circ\text{C}$, $V_{DD}=5\text{V}$)

Parameter	Test Condition	Symbol	Value			Unit
			Min	Typ	Max	
Operate Point	S pole to branded side	B_{OPS}	-	3	6	mT
	N pole to branded side	B_{OPN}	-6	-3	-	mT
Release Point	S pole to branded side	B_{RPS}	0.5	2.5	-	mT
	N pole to branded side	B_{RPN}	-	-2.5	-0.5	mT
Hysteresis	$ B_{OPX} - B_{RPX} $	B_{HYS}	-	0.5	-	mT


Switching Characteristics


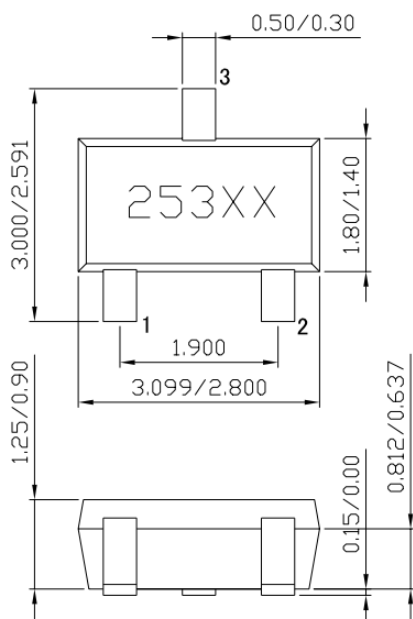
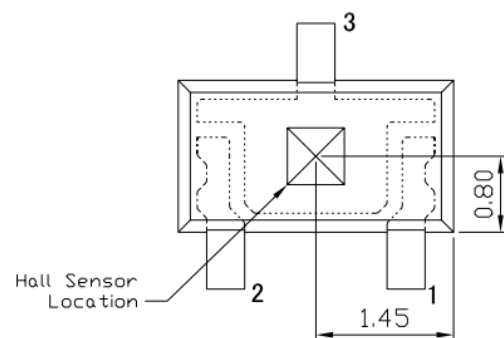
Performance Graphs


Sensor Location, Package Dimensions and Marking
UA-package: T092S

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
(Top view)**

**Hall sensor location
(Bottom view)**

NOTES:

1. PINOUT:
 Pin 1 V_{DD}
 Pin 2 Output
 Pin 3 GND
2. Controlling dimension: mm;
3. Lead thickness after solder plating will be 0.254mm maximum.