

SH281 Low sensitivity Unipolar Hall Effect Switch

SH281 is a low sensitivity unipolar Hall-effect switch designed in advanced DMOS technology. The following are integrated on a single silicon chip: voltage regulator, reverse bias protection, ESD protection, Hall voltage generator, chopper stabilized, small-signal amplifier, Schmitt trigger, and open-drain output. Superior high-temperature performance is made possible through advanced chopper stabilization technology.

Features

- Low sensitivity (17.5mT typ.)
- Stable Temperature Characteristics
- Good ESD Protection. (HBM \pm 4kV min.)
- Reverse bias protection on power supply pin

Typical Applications

- Solid state switch
- Limit switch
- Current limit
- Interrupter
- Current sensing

Order Information

Order No.	Part No.	Temperature	Package	Packing
SH281KUA	SH281	K	UA	
SH281KSO-TR	SH281	K	SO	— TR

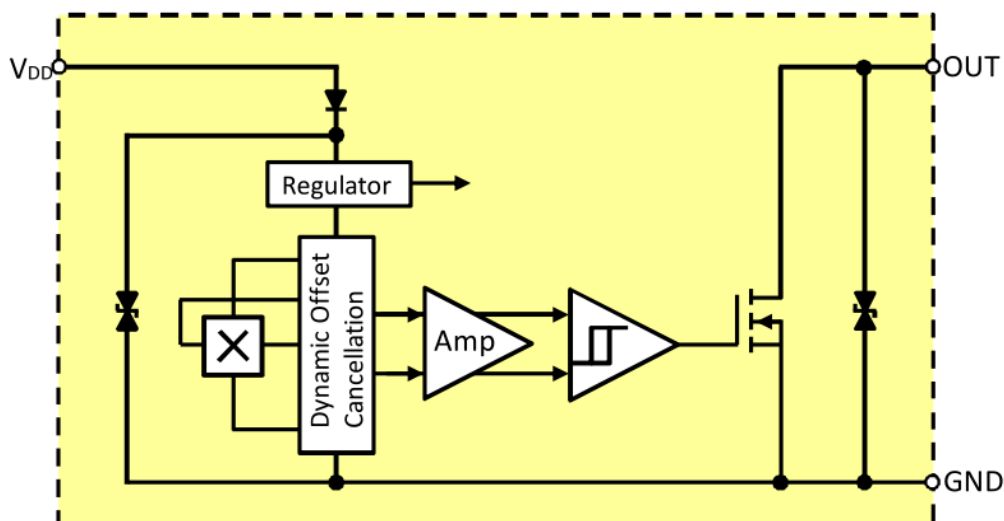
Legend:

Temperature Code: K (-40°C~125°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 ($T_A=25^\circ\text{C}$)

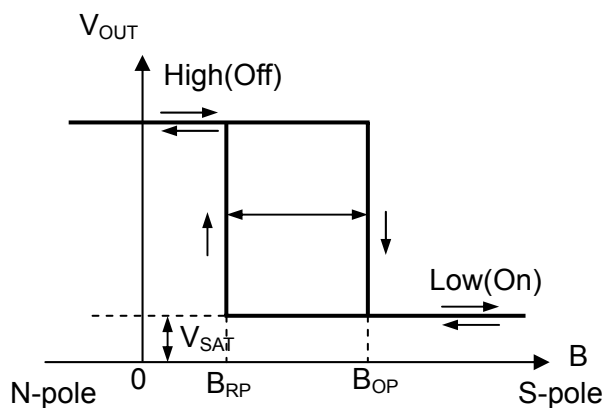
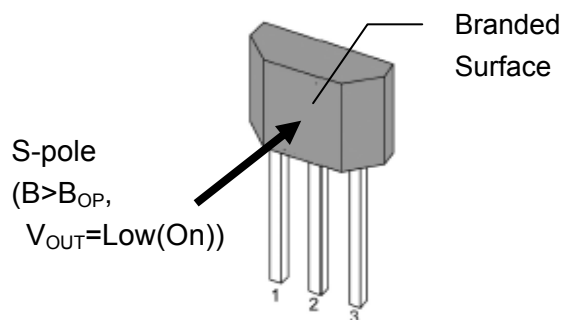
Parameter	Symbol	Value		Unit
		Min	Max	
Supply Voltage	V_{DD}	-28	28	V
Output Voltage	V_{OUT}	-0.3	28	V
Output Current	I_{OUT}	-	50	mA
Operating Temperature Range (K)	T_A	-40	125	$^\circ\text{C}$
Storage Temperature Range	T_S	-55	150	$^\circ\text{C}$
Maximum Junction Temperature	T_J	-	150	$^\circ\text{C}$
Power Dissipation (UA/SO)	P_D	-	606/230	mW

Electrical Characteristics ($T_A=25^\circ\text{C}$, $V_{DD}=12\text{V}$)

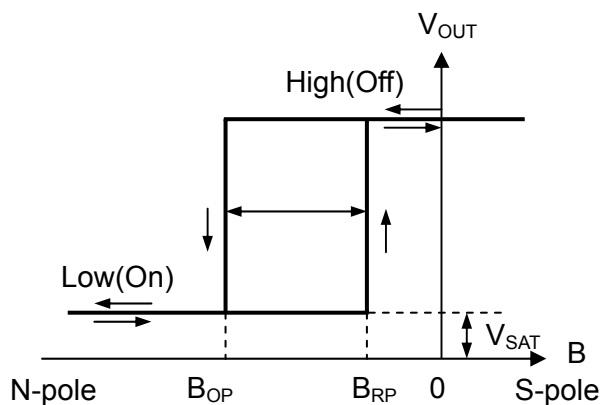
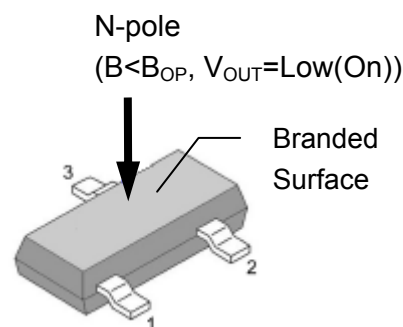
Parameter	Test Condition	Symbol	Value			Unit
			Min	typ	Max	
Supply Voltage		V_{DD}	3	-	24	V
Consumption Current	$V_{OUT}=\text{High}$	I_{DD}	-	2.5	5	mA
Output Saturation Voltage	$I_{SINK}=20\text{mA}$, $V_{OUT}=\text{Low}$	V_{SAT}	-	-	0.5	V
Output Leakage Current	$V_{OUT}=\text{High}$ (20V)	I_{LEAK}	-	-	10	μA
Output Rise time	$R_L=1\text{k}\Omega$, $C_L=20\text{pF}$	t_R	-	0.04	-	μs
Output Fall time	$R_L=1\text{k}\Omega$, $C_L=20\text{pF}$	t_F	-	0.18	-	μs
Electro-Static Discharge	HBM	-	4	-	-	kV

UA-package Magnetic Characteristics ($T_A=25^\circ\text{C}$, $V_{DD}=12\text{V}$)

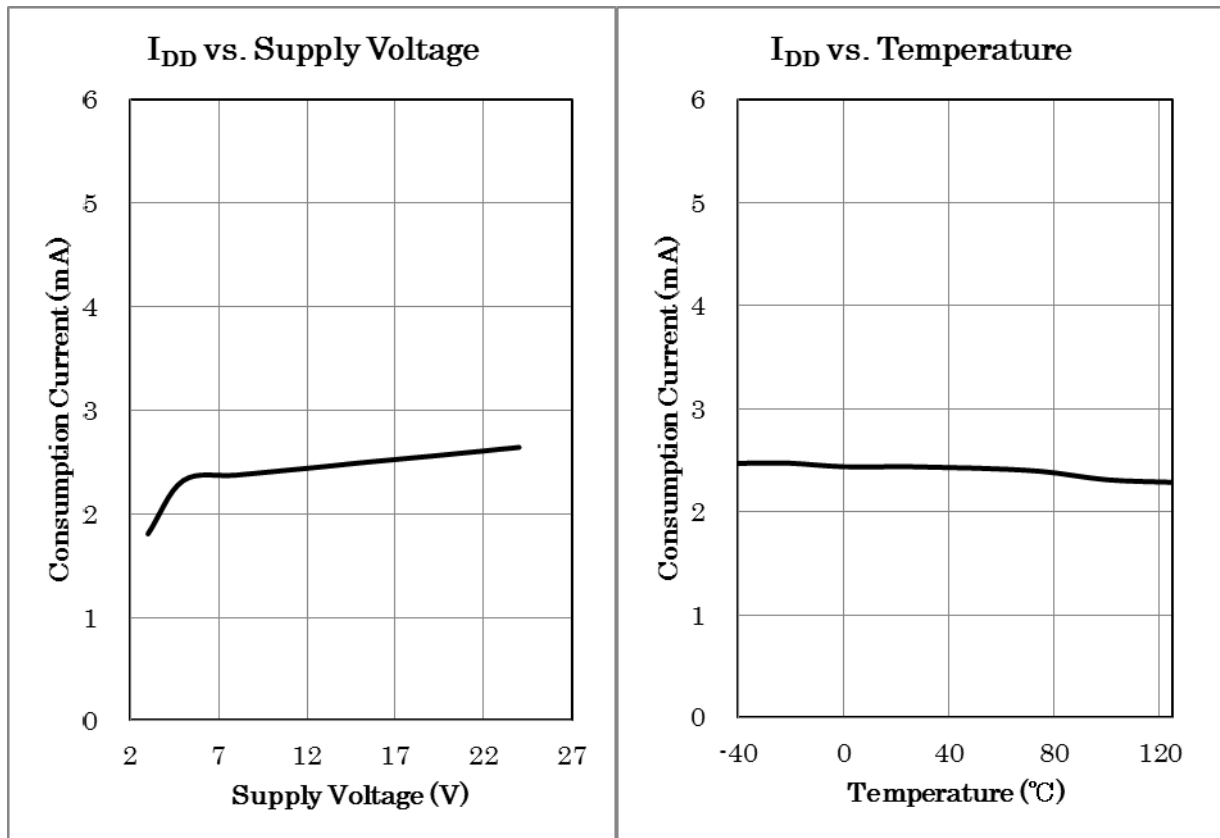
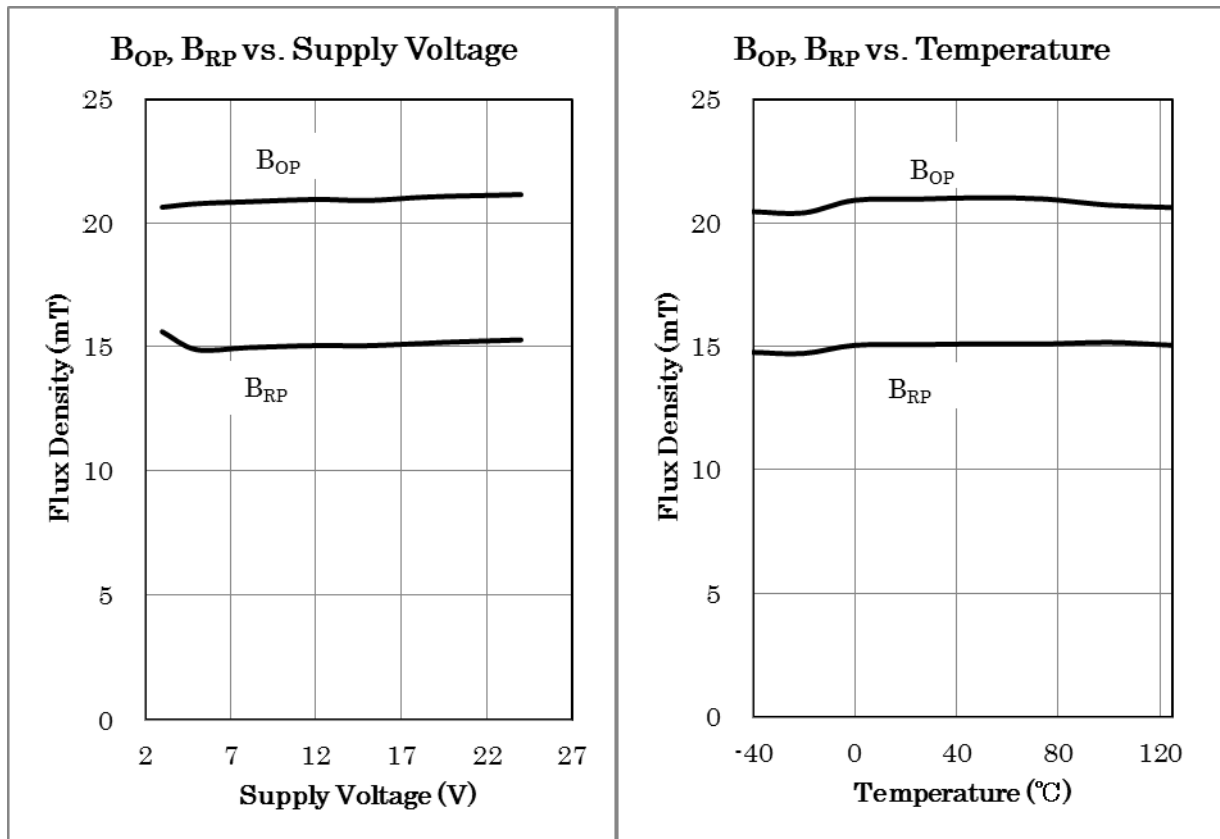
Parameter	Test Condition	Symbol	Value			Unit
			Min	typ	Max	
Operating Point	S pole to branded side	B_{OP}	-	17.5	25	mT
Release Point	S pole to branded side	B_{RP}	9.5	-	-	mT
Hysteresis		B_{HYS}	-	4.5	-	mT

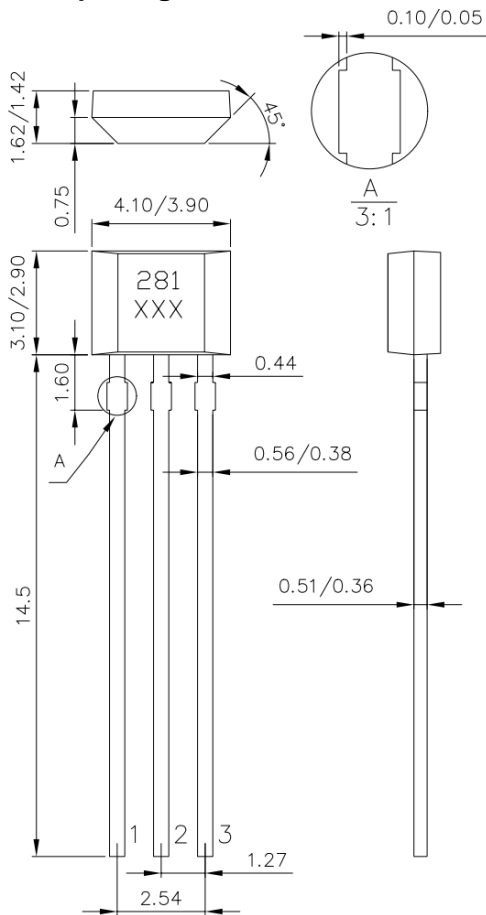
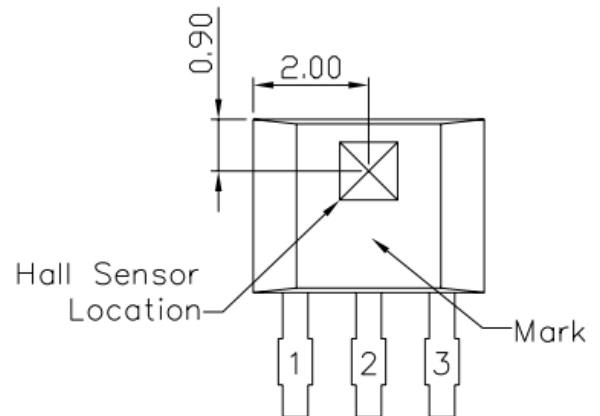

Switching Characteristics

UA-package
SO-package Magnetic Characteristics ($T_A=25^\circ\text{C}$, $V_{DD}=12\text{V}$)

Parameter	Test Condition	Symbol	Value			Unit
			Min	Value typ	Max	
Operating Point	N pole to branded side	B_{OP}	-25	-17.5	-	mT
Release Point	N pole to branded side	B_{RP}	-	-	-9.5	mT
Hysteresis		B_{HYS}	-	4.5	-	mT

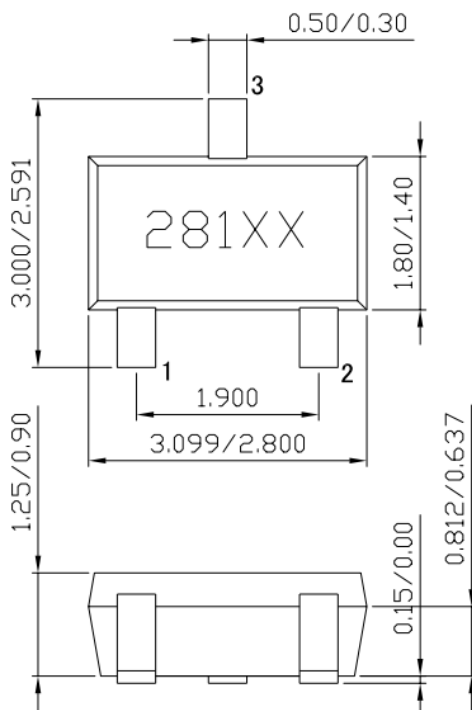
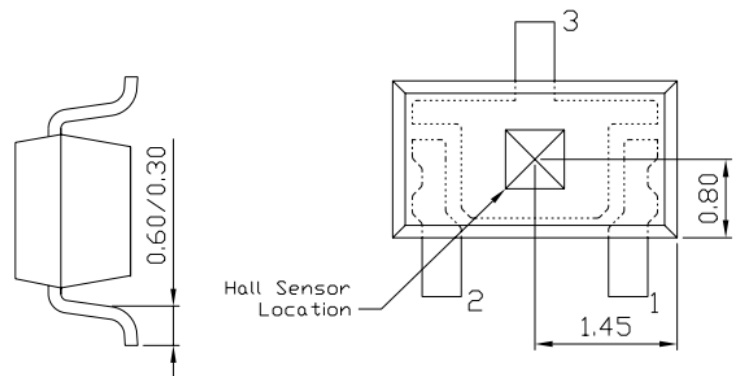

Switching Characteristics

SO-package

Performance Graphs



Sensor Location, Package Dimension 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.