HAL254 Hall-effect sensor is a temperature stable, stress-resistant, Low Tolerance ofSensitivity micro-power switch. Superior high-temperature performance is made possible through a dynamic offset cancellation that utilizes chopper-stabilization. This method reduces the offset voltage normally caused by device over molding, temperature dependencies, and thermal stress.

HAL254is special made for low operation voltage, 1.65V, to active the chip which is includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, CMOS output driver. Advanced CMOS wafer fabrication processing is used to take advantage of low-voltage requirements, component matching, very low input-offset errors, and small component geometries. This device requires the presence of unipolar magnetic fields for operation.

The package type is in a Halogen Free version has been verified by third party Lab.

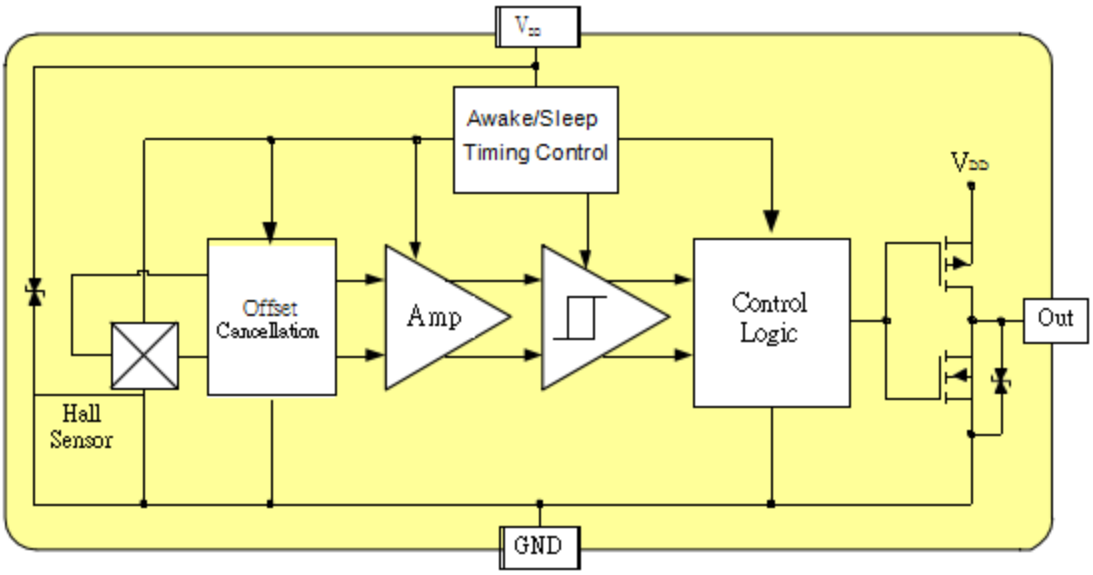
Features and Benefits

- CMOS Hall IC Technology
- Strong RF noise protection
- 1.65 to 6V for battery-powered applications
- Operation down to 1.65V, Unipolar Hall Switch Micro power consumption
- High Sensitivity for reed switch replacement applications
- Low sensitivity drift in crossing of Temp. range
- Ultra Low power consumption at 5uA (Avg)
- High ESD Protection, HBM > ±4KV(min)
- Totem-pole output

Applications

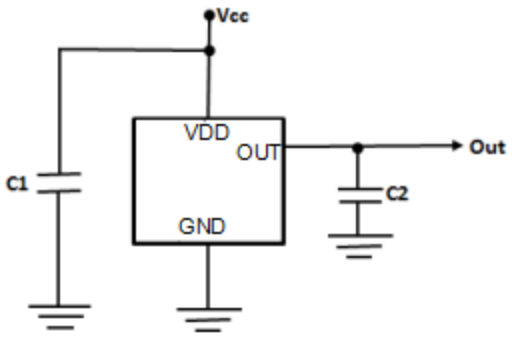
- Solid state switch
- Handheld Wireless Handset Awake Switch (Flip Cell/PHS Phone/Note Book/Flip Video Set)
- Magnet proximity sensor for reed switch replacement in low duty cycle applications
- Water Meter
- PDA
- PDVD
- NB
- Pad PC

Functional Diagram



***Note**: Static sensitive device; please observe ESD precautions. Reverse V_{DD} protection is not included. For reverse voltage protection, a 100Ω resistor in series with V_{DD} is recommended.*
HAL254, HBM > ±4KV which is verified by third party lab.

Typical application circuit



C1：10nF
C2：100pF

Absolute Maximum Ratings At(Ta=25 ℃)

Characteristics		Values	Unit
Supply voltage,(V_{DD})		7	V
Output Voltage,(V_{out})		7	V
Reverse Voltage , (V_{DD}) (V_{OUT})		-0.3	V
Magnetic flux density		Unlimited	Gauss
Output current,(I_{OUT})		1	mA
Operating temperature range, (Ta)		-40 to +85	℃
Storage temperature range, (Ts)		-65 to +150	℃
Maximum Junction Temp,(Tj)		150	℃
Thermal Resistance	(θ_{JA}) VK / SN	227 / 540	℃/W
	(θ_{JC}) VK / SN	49 / 390	℃/W
Package Power Dissipation, (P_D) VK / SN		550 / 230	mW

Note: *Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.*

Electrical Specifications

DC Operating Parameters ：Ta=25 ℃, V_{DD}=1.8V

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage,(V_{DD})	Operating	1.65		6	Volts
Supply Current,(I_{DD})	Awake State		1.4	3	mA
	Sleep State		3.6	7	μA
	Average		5	10	μA
Output Leakage	Output off			1	uA
Output High Voltage,(V_{OH})	I_{OUT}=0.5mA(Source)	V_{DD}-0.2			V
Output Low Voltage,(V_{OL})	I_{OUT}=0.5mA(Sink)			0.2	V
Awake mode time,(T_{aw})	Operating		40	80	uS
Sleep mode time,(T_{SL})	Operating		40	80	mS
Duty Cycle,($D.C$)			0.1		%
Electro-Static Discharge	HBM	4			KV

HAL254EST Magnetic Specifications

DC Operating Parameters ：Ta=25℃, V_{DD}=1.8V

Parameter	*Symbol*	*Test Conditions*	*Min.*	*Typ.*	*Max.*	*Units*
Operating Point	B_{OP}	N pole to branded side, B > BOP, Oout On		30	50	Gauss
Release Point	B_{RP}	N pole to branded side, B < BRP, Vout Off	10	20		Gauss
Hysteresis	B_{HY}	|BOPx - BRPx|		10		Gauss

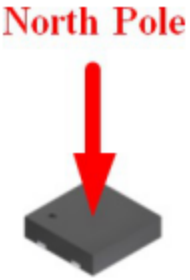
HAL254EST Output Behavior versus Magnetic Polar

DC Operating Parameters ：Ta = -40 to 85 ℃, V_{DD} =1.8V to 6V

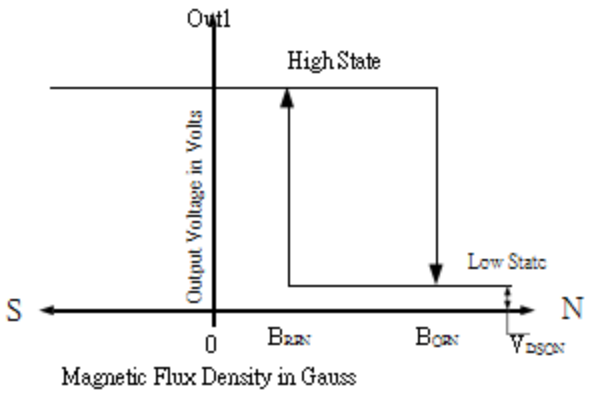
Parameter	*Test condition*	*OUT1*
Null or weak magnetic field	B=0 or B < BRP	High
North pole	B>Bop(55~10)	Low

UA Package

ST Package

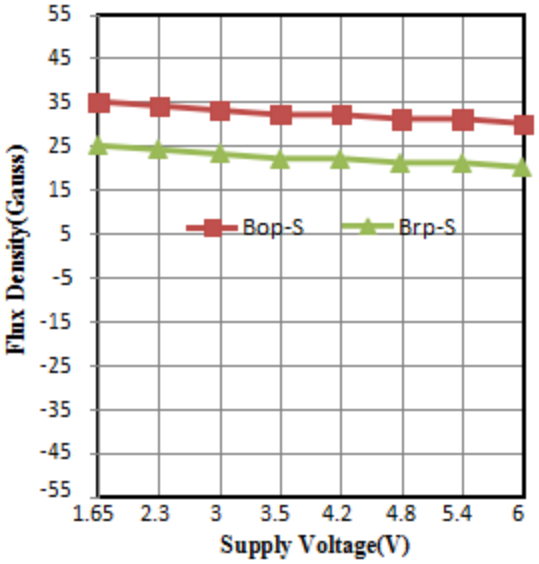


SD Package

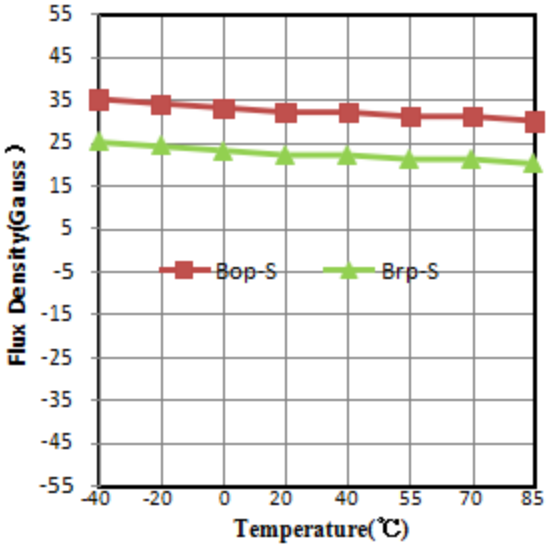


Performance Graph

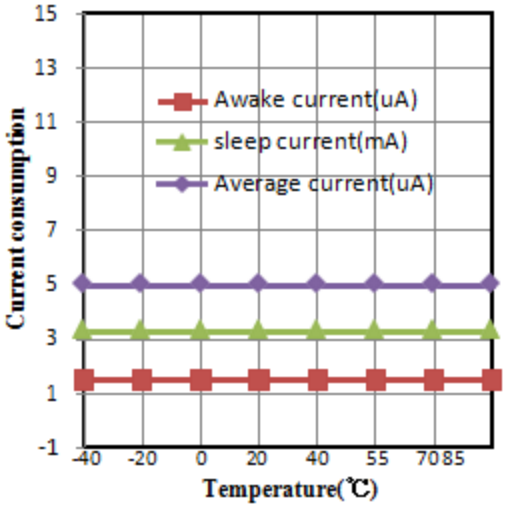
Typical Supply Voltage(V_{DD}) Versus Flux Density



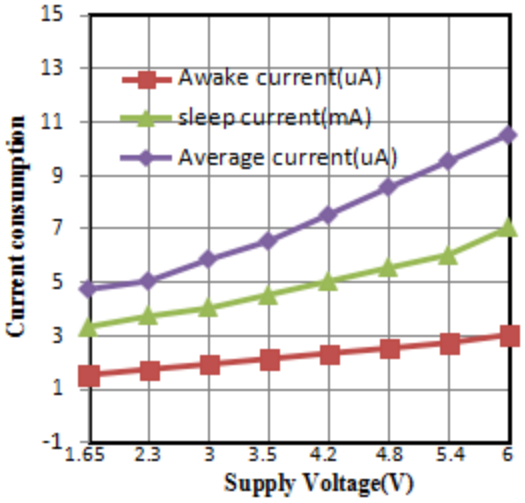
Typical Temperature(T_A) Versus Flux Density



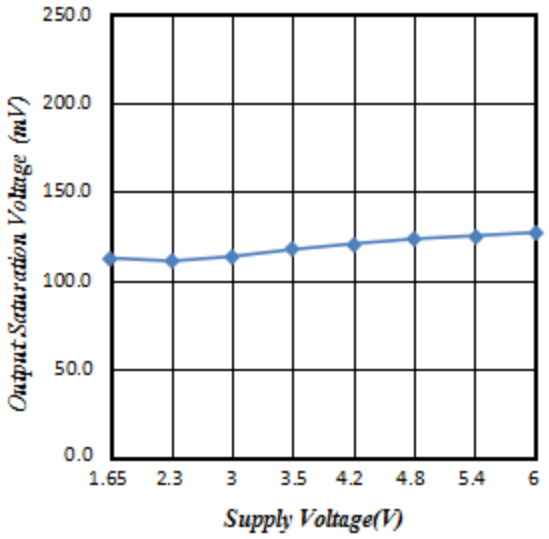
Typical Temperature(T_A) Versus Supply Current(I_{DD})



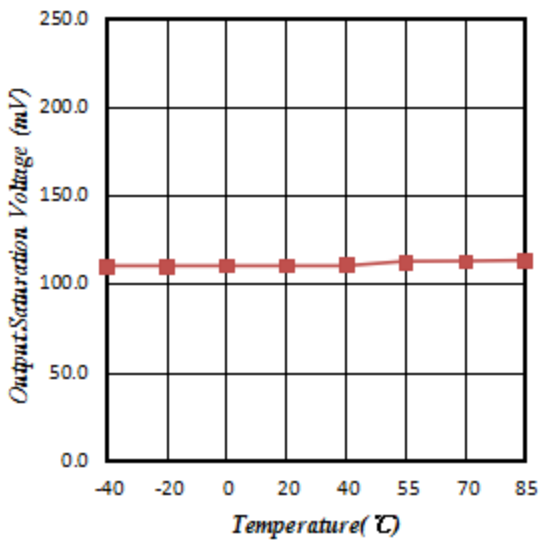
Typical Supply Voltage(V_{DD}) Versus Supply currentcurrent(I_{DD})



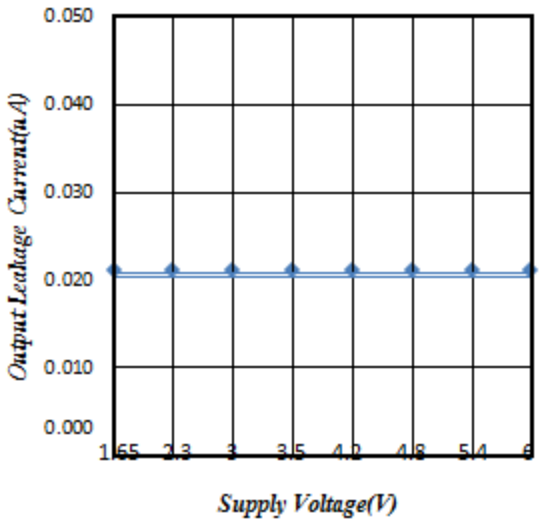
Typical Supply Voltage(V_{DD}) Versus Output Voltage(V_{DSON})



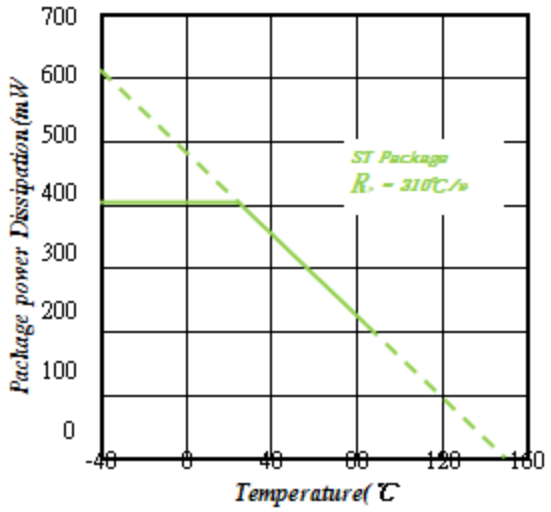
Typical Temperature(T_A) Versus Output Voltage(V_{DSON})



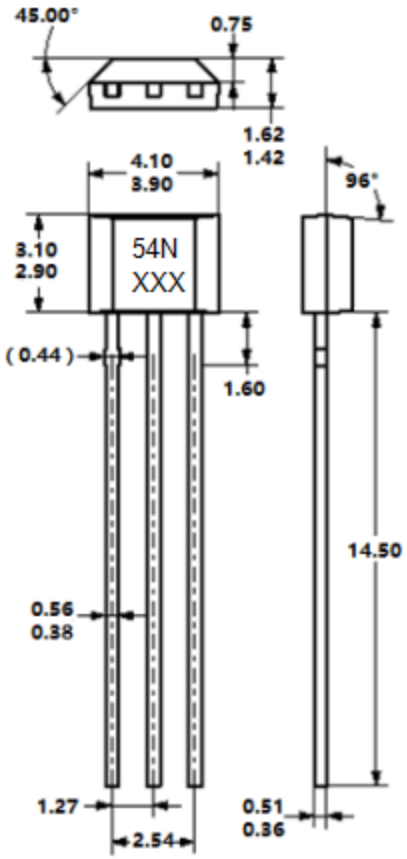
Typical Supply Voltage(V_{DD}) Versus Leakage Current(I_{OFF})



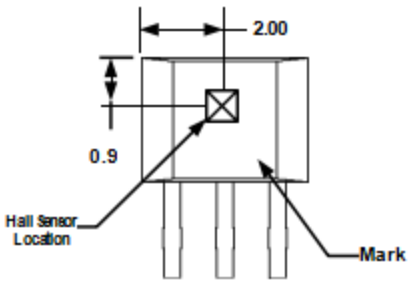
Power Dissipation versus Temperature(T_A)



UA Package



Hall Chip location



NOTES:

1).Controlling dimension: mm

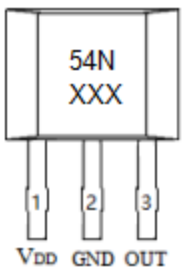
2).Leads must be free of flash and plating voids

3).Do not bend leads within 1 mm of lead to package interface.

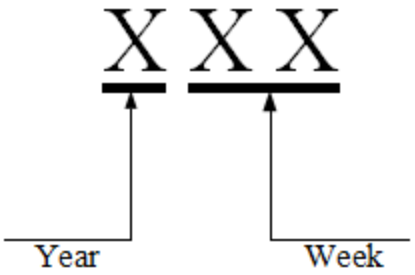
4).PINOUT:

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

Output Pin Assignment (Top view)



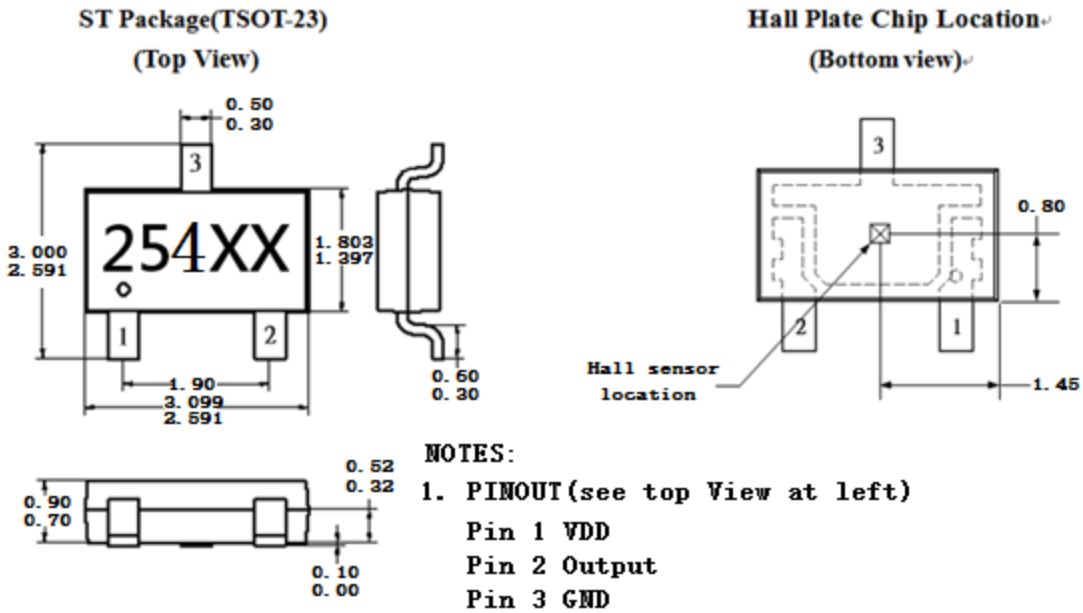
HAL254 UA(TO-92S) Package Date Code



EX：2016 Year_8 Week →608

Sensor Location, package dimension and marking

HAL254Package

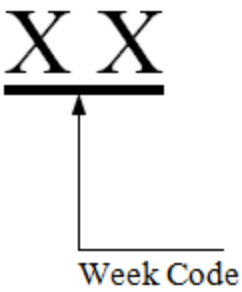


NOTES:

1. PINOUT(see top View at left)
   Pin 1 VDD
   Pin 2 Output
   Pin 3 GND

2. Controlling dimension:mm

HAL254 *ST Package Date Code*



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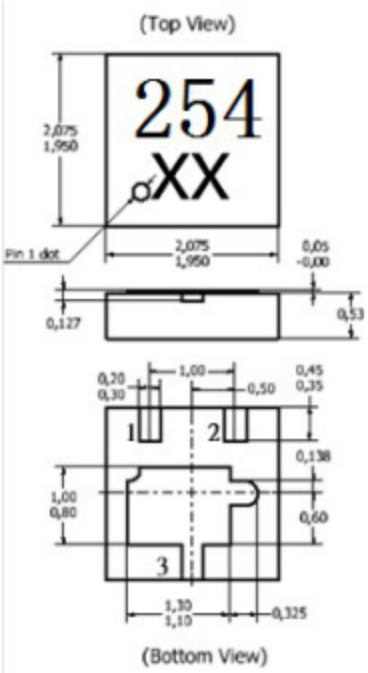
code	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM
week	14	15	16	17	18	19	20	21	22	23	24	25	26
code	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ
week	27	28	29	30	31	32	33	34	35	36	37	38	39
code	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM
week	40	41	42	43	44	45	46	47	48	49	50	51	52
code	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ

EX：2014 Year_8 Week → SH

Sensor Location, package dimension and marking

***HAL254* SD Package**

SD Package

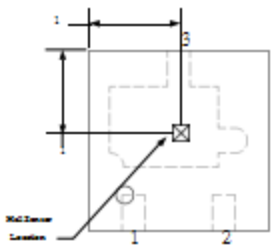


NOTES:

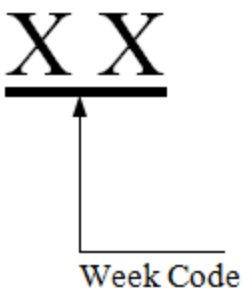
1. PINOUT (See Top View at left)
   Pin 1 V_{DD}
   Pin 2 Output
   Pin 3 GND
2. Controlling dimension: mm;
3. Chip rubbing will be 10mil maximum;
4. Chip must be in PKG. center.

Hall Plate Chip Location

(Top view)



HAL254 SQ Package Date Code



week	1	2	3	4	5	6	7	8	9	10	11	12	13
code	SA	SB	SC	SD	SE	SF	SG	SH	SI	SJ	SK	SL	SM
week	14	15	16	17	18	19	20	21	22	23	24	25	26
code	SN	SO	SP	SQ	SR	SS	ST	SU	SV	SW	SX	SY	SZ
week	27	28	29	30	31	32	33	34	35	36	37	38	39
code	TA	TB	TC	TD	TE	TF	TG	TH	TI	TJ	TK	TL	TM
week	40	41	42	43	44	45	46	47	48	49	50	51	52
code	TN	TO	TP	TQ	TR	TS	TT	TU	TV	TW	TX	TY	TZ

EX：2014 Year_8 Week → SH

Ordering Information

Part No	Package Code	Mini Packing
HAL254ST	ST(TSOT-23-3L)	3000PCS
HAL254UA	UA(TO92S)	1000PCS
HAL254SD	SD(DFN2020-3L	3000PCS