



TSOT-23



Pin Definition:

1. V_{CC}
2. Output
3. GND

Description

TSH248 Hall-effect sensor is a temperature stable, stress-resistant, 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.

TSH248 includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, open-drain output. 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.

Features

- CMOS Hall IC Technology
- Solid-State Reliability
- Low power consumption for battery applications
- Operation voltage range from 2.5V~3.5V

Ordering Information

Part No.	Package	Packing
TSH248CX RFG	TSOT-23	3kpcs / 7" Reel

Note: "G" denote for Halogen Free Product

Application

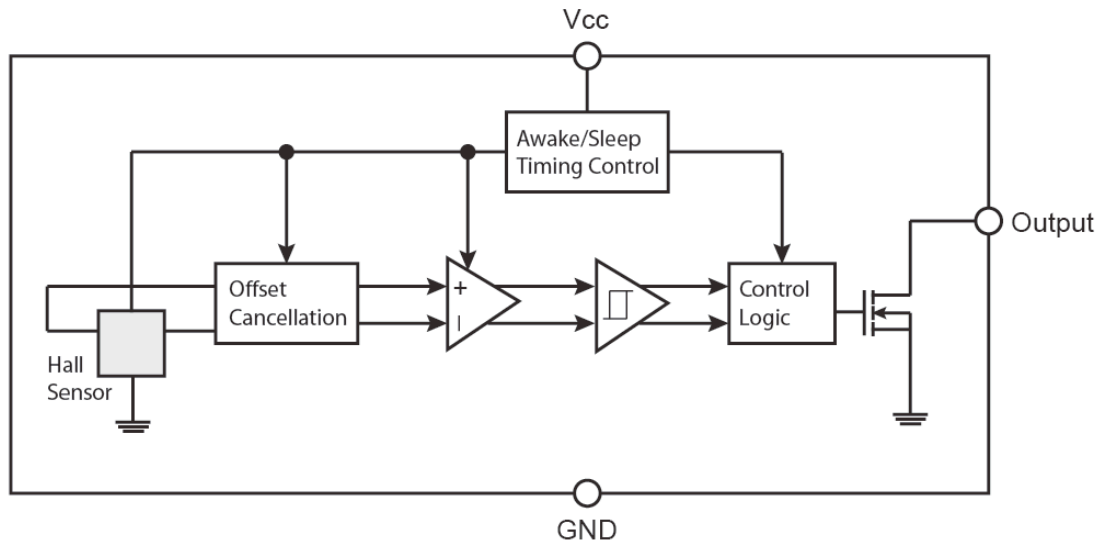
- Solid state switch
- Lid close sensor for power supply devices
- Magnet proximity sensor for reed switch replacement in high duty cycle applications.
- Handheld Wireless Handset Awake Switch (Flip Cell/PHS Phone/Note Book/Flip Video Set)

Absolute Maximum Ratings (Ta = 25°C unless otherwise noted)

Characteristics	Limit	Value	Unit
Supply voltage	V _{CC}	5	V
Output Voltage	V _{OUT}	5	V
Reverse voltage	V _{CC/OUT}	-0.3	V
Magnetic flux density		Unlimited	G
Output current	I _{OUT}	2	mA
Operating Temperature Range	T _{OPR}	-40 to +85	°C
Storage temperature range	T _{STG}	-55 to +150	°C
Maximum Junction Temp	T _J	150	°C
Thermal Resistance - Junction to Ambient	R _{θJA}	543	°C/W
Thermal Resistance - Junction to Case	R _{θJC}	410	°C/W
Package Power Dissipation	P _D	230	mW

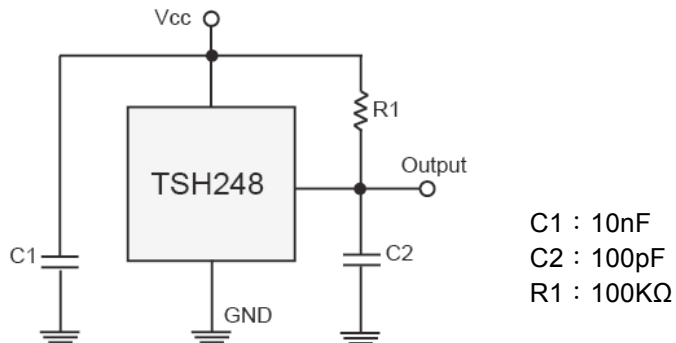
Note: Exceeding the absolute maximum ratings may cause permanent damage. Exposure to absolute maximum-rated conditions for extended periods may affect device reliability.

Block Diagram



Note: Static sensitive device; please observe ESD precautions. Reverse V_{CC} protection is not included. For reverse voltage protection, a 100Ω resistor in series with V_{CC} is recommended.

Typical Application Circuit





Electrical Specifications (DC Operating Parameters: $T_A=+25^{\circ}\text{C}$, $V_{CC}=3\text{V}$)

Parameters	Test Conditions	Min	Typ	Max	Units
Supply Voltage	Operating	2.5	--	3.5	V
Supply Current	Awake State	--	2.5	4.0	mA
	Sleep State	--	8.0	12	μA
	Average	--	10	16	μA
Output Low Voltage	$I_{\text{OUT}}=1\text{mA}$	--	--	0.3	V
Output Leakage Current	Output off	--	--	1	μA
Awake Mode Time	Operating	--	70	--	μs
Sleep Mode Time	Operating	--	70	--	ms
Duty Cycle		--	0.1	--	%

Magnetic Specifications

DC Operating Parameters $T_A=25^{\circ}\text{C}$, $V_{CC}=3.0\text{V}$

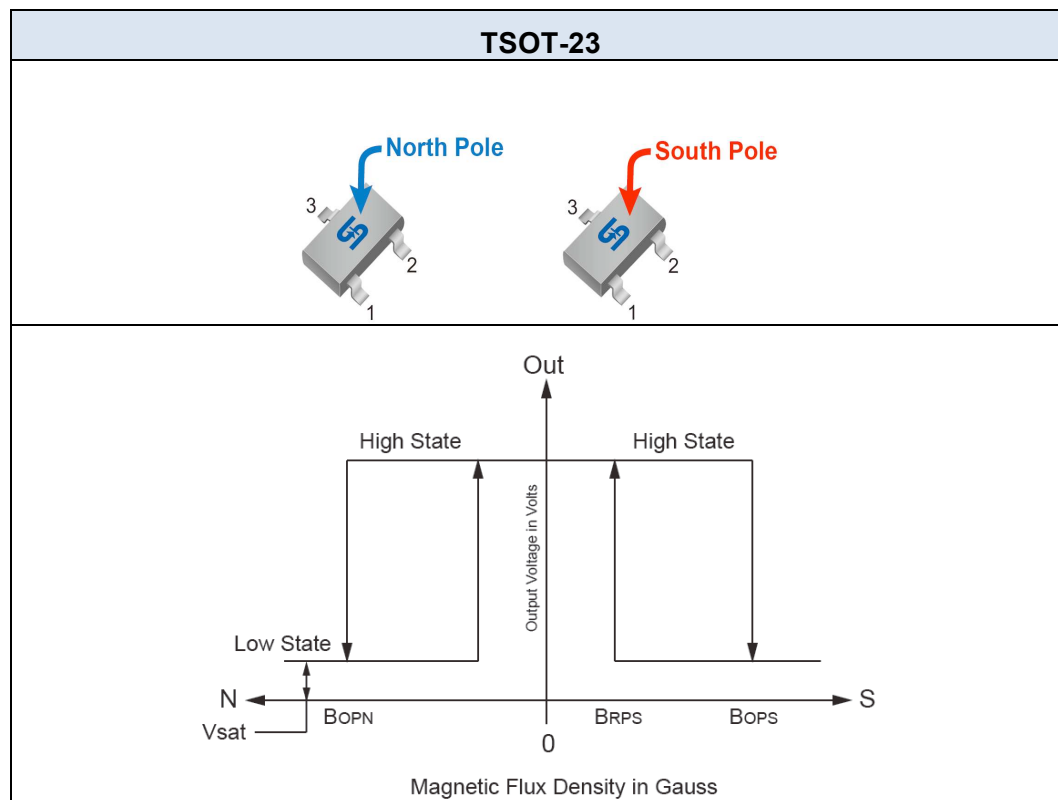
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Operating Point	B_{OPS}	N pole to branded side, $B > B_{\text{OP}}$, V_{OUT} On	6	--	60	G
	B_{OPN}	S pole to branded side, $B > B_{\text{OP}}$, V_{OUT} On	-60	--	-6	G
Release Point	B_{RPS}	N pole to branded side, $B < B_{\text{RP}}$, V_{OUT} Off	5	--	-59	G
	B_{RPN}	S pole to branded side, $B < B_{\text{RP}}$, V_{OUT} Off	-60	--	-5	G
Hysteresis	B_{HYS}	$ B_{\text{OPx}} - B_{\text{RPx}} $	--	7	--	G

Note: 1G (Gauss) = 0.1mT (millitesla)

Output Behavior versus Magnetic Pole

DC Operating Parameters: $T_A = -40$ to 85°C , $V_{CC} = 2.5\text{V} \sim 3.5\text{V}$

Parameter	Test condition	OUT
South pole	$B < B_{op}[(-60) \sim (-6)]$	Low
Null or weak magnetic field	$B = 0$ or $B < B_{RP}$	Open (Pull-up Voltage)
North pole	$B > B_{op}(60 \sim 6)$	Low



Characteristic Performance

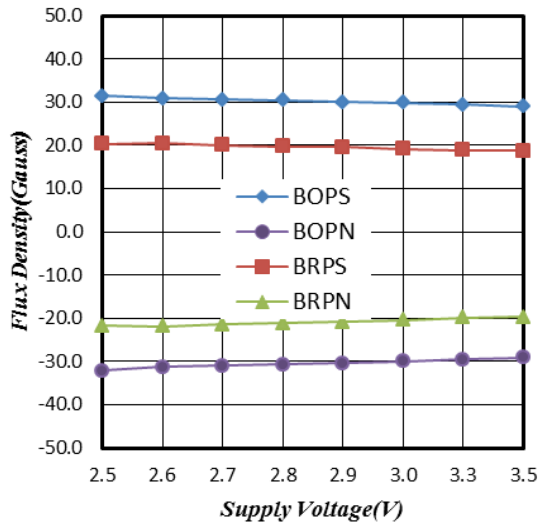


Figure 1. Flux Density vs. Supply Voltage

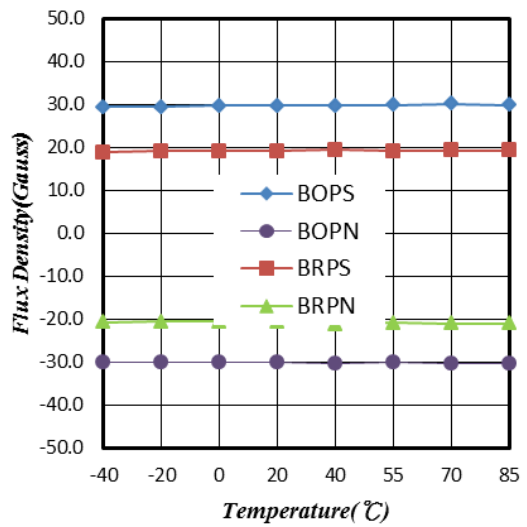


Figure 2. Flux Density vs. Temperature

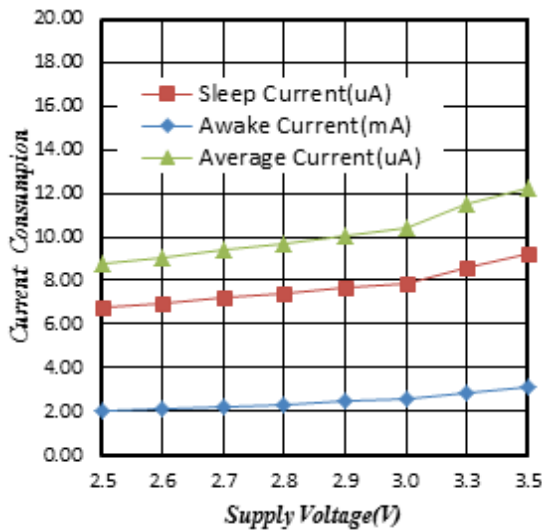


Figure 3. Supply Current vs. Supply Voltage

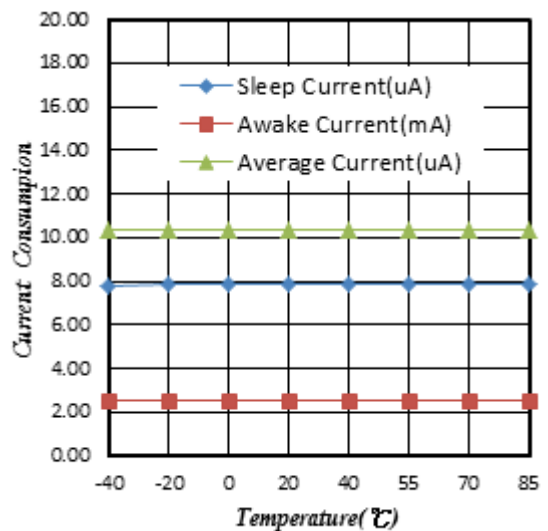


Figure 4. Supply Current vs. Temperature

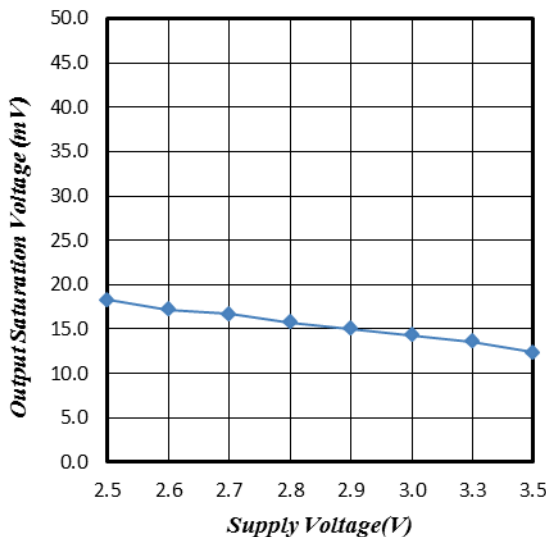


Figure 5. Output Saturation Voltage vs. Supply Voltage

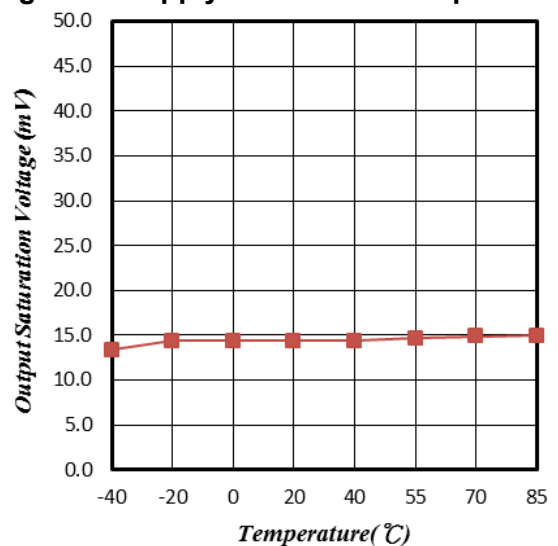


Figure 6. Output Saturation Voltage vs. Temperature

Characteristic Performance

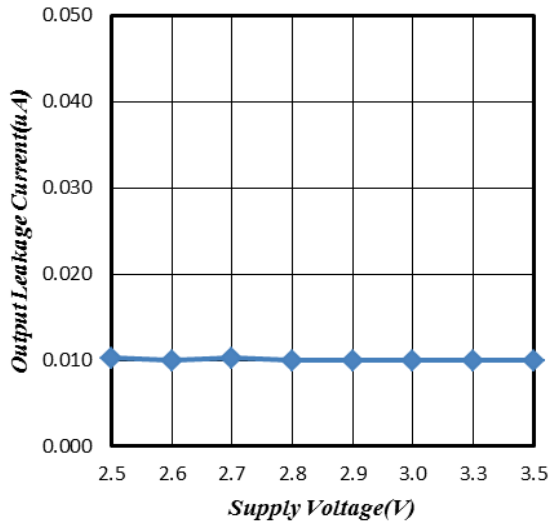
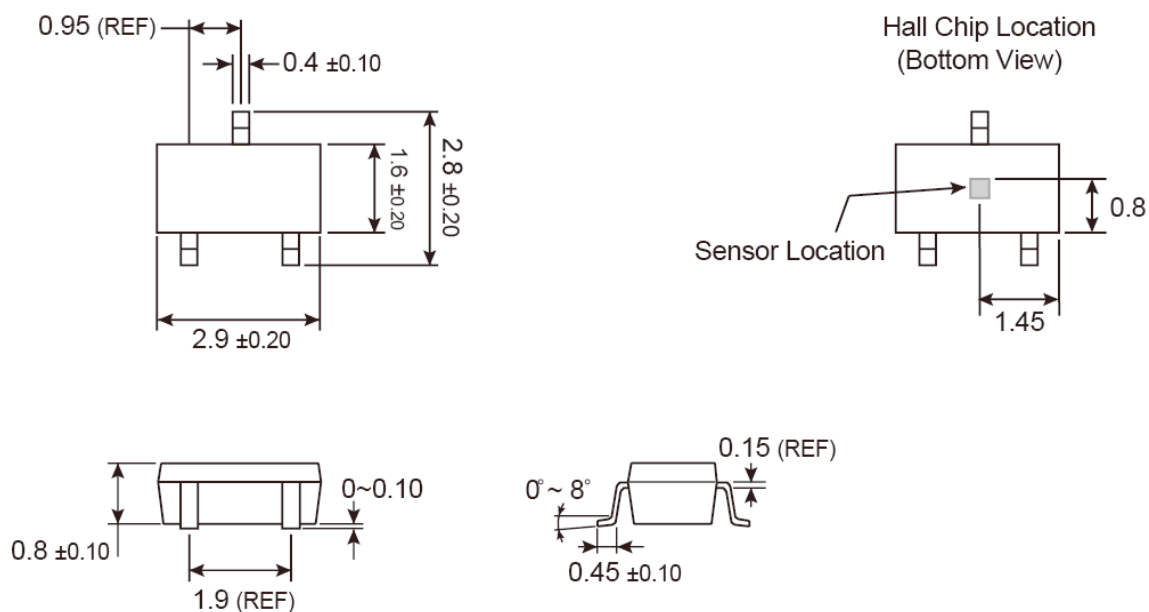


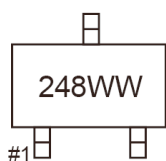
Figure 7. Output Leakage Current vs. Supply Voltage

TSOT-23 Mechanical Drawing



Unit: Millimeters

Marking Diagram



248 = Device Code
WW = Week Code Table

week	1	2	3	4	5	6	7	8	9	10	11	12	13
code	OA	OB	OC	OD	OE	OF	OG	OH	OI	OJ	OK	OL	OM
week	14	15	16	17	18	19	20	21	22	23	24	25	26
code	ON	OO	OP	OQ	OR	OS	OT	OU	OV	OW	OX	OY	OZ
week	27	28	29	30	31	32	33	34	35	36	37	38	39
code	PA	PB	PC	PD	PE	PF	PG	PH	PI	PJ	PK	PL	PM
week	40	41	42	43	44	45	46	47	48	49	50	51	52
code	PN	PO	PP	PQ	PR	PS	PT	PU	PV	PW	PX	PY	PZ

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