MICROPOWER, ULTRA-SENSITIVE HALL EFFECT SWITCH

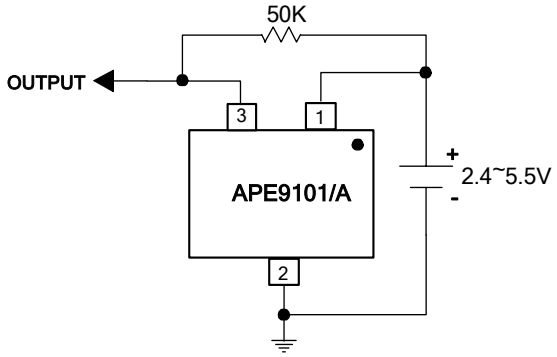
FEATURES

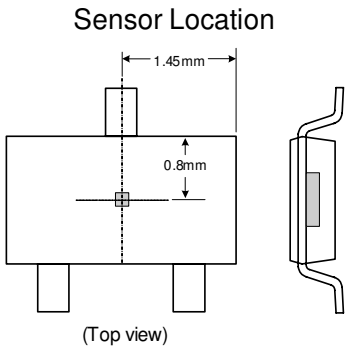
- **2.4V to 5.5V Battery Operation**
- **Chopper Stabilized Technology**
- **Micro Power Operation for Battery Applications**
- **Operation with North or South Pole**
- **High Sensitivity and High Stability of the Magnetic Switching Points**
- **3-pin SOT-23 & TSOT-23 Pb-Free Package**

DESCRIPTION

APE9101/A is a three-terminal Hall Effect sensor device with a output driver, mainly designed for battery – operation, hand-held equipment (such as Cellular and Cordless Phone, PDA). After power-on, APE9101/A will detect and setup the operating pole (North or South) to avoid another side magnetic noise (Patent pending). For APE9101, the output will be turned off under no magnetic field. While the magnetic flux density (B) is larger than operate point (Bop), the output will be turned on; the output is latched until B is lower than release point (Brp).

TYPICAL APPLICATION

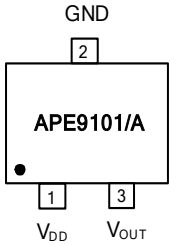




PACKAGE / ORDERING INFORMATION

APE9101X X

Output	Package Type
Blank: Pull High	N : SOT-23
A: Pull Low	TN : TSOT-23



(SOT-23/TSOT-23)

(TOP VIEW)

ABSOLUTE MAXIMUM RATINGS (at T_A=25℃)

Supply Voltage Pin (V_{DD}) ---------- -0.3 to 6V
Output Voltage Pin(V_{OUT}) ---------- -0.3 to 6V
Output Current Pin (I_{OUT}) ---------- 2mA
Power Dissipation(P_D) ---------- 230mW
Storage Temperature Range(T_{ST}) ---------- -65℃ To 150℃
Operating Temperature Range(T_{OP}) ---------- -40℃ To 85℃
Junction Temperature(T_J) ---------- 125℃
Thermal Resistance from Junction to Ambient(Rth_{JA}) 550℃/W

Note. Rth_{JA} is measured with the PCB copper area of approximately 1 in^2(Multi-layer).

ELECTRICAL SPECIFICATIONS

(V_{DD}=2.75V, T_A=25℃, unless otherwise specified)

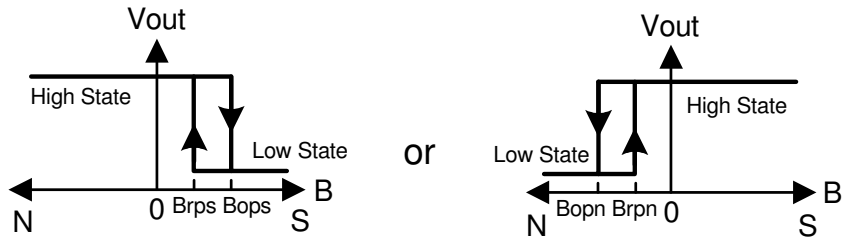
Parameter	SYM	TEST CONDITION	MIN	TYP	MAX	UNITS
Supply Voltage	V_{DD}		2.4	-	5.5	V
Input Current		Awake State	-	2	4	mA
		Sleep State	-	7	12	uA
		Average	-	9	16	uA
Output Saturation Voltage	V_{OSAT}	I_O=1mA	-	0.1	0.3	V
Output Leakage Current	I_{O-LEAK}	VOUT=5.5V, B<Brp	-	0.01	1	uA
Output Wake-Up Time	$T_{wake-up}$		-	70	120	us
Period	T_{Period}		-	70	120	ms
Duty Cycle			-	0.1	-	%
North or South Pole Detection and Setup Time	T_{Set}	Continuous >B_{OPS} or <B_{OPN}	-	210	400	ms

MAGNETIC CHARACTERISTICS

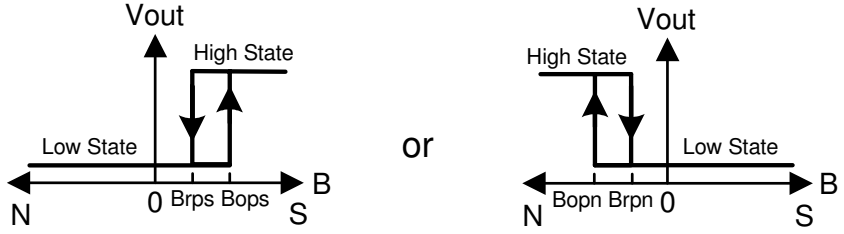
(V_{DD} = 2.75V, T_A=25℃, unless otherwise specified)

Parameter	SYM	TEST CONDITION	MIN	TYP	MAX	UNITS
Operating Points	B_{OPS}		-	35	55	Gauss
	B_{OPN}		-55	-35	-	
Release Points	B_{RPS}		10	25	-	
	B_{RPN}		-	-25	-10	
Hysteresis	B_{hys}		-	10	-	

1.APE9101



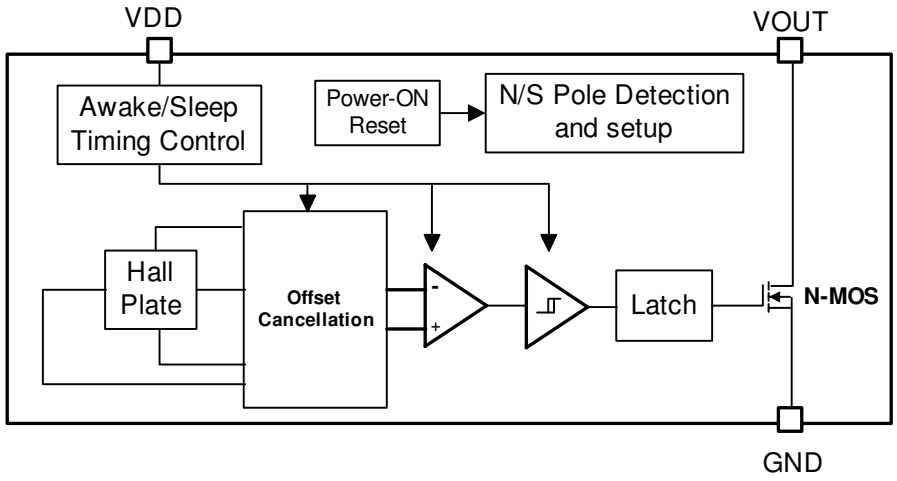
2.APE9101A



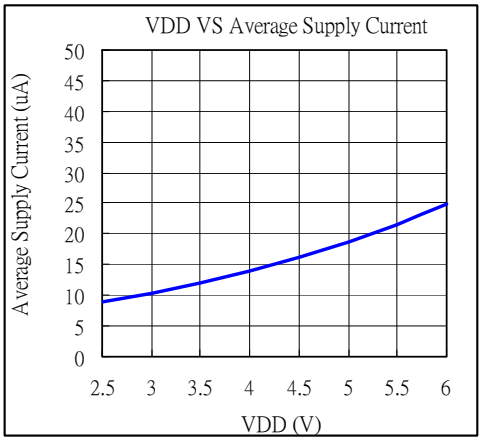
PIN DESCRIPTIONS

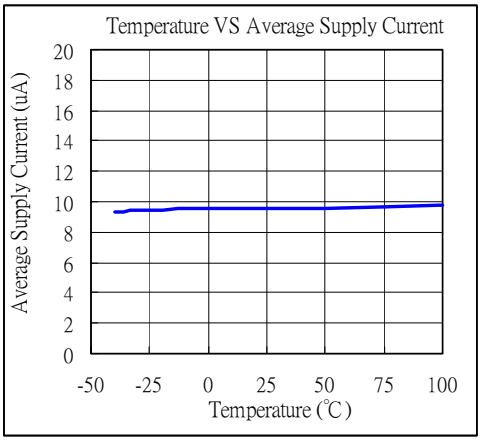
PIN SYMBOL	PIN DESCRIPTION
VDD	Power Input Pin
GND	Ground
OUTPUT	APE9101 B>Bops or B<Bopn, Output is Low. B<Brps or B> Brpn, Output is High. APE9101A B>Bops or B<Bopn, Output is High. B<Brps or B> Brpn, Output is Low.

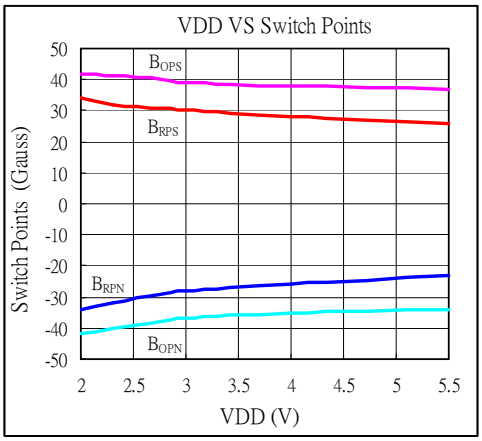
BLOCK DIAGRAM

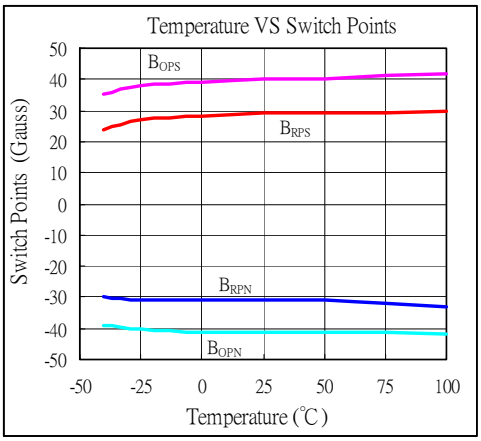


TYPICAL PERFORMANCE CHARACTERISTICS



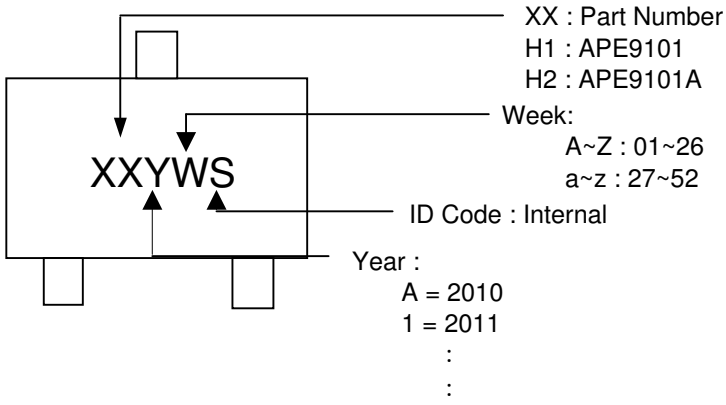






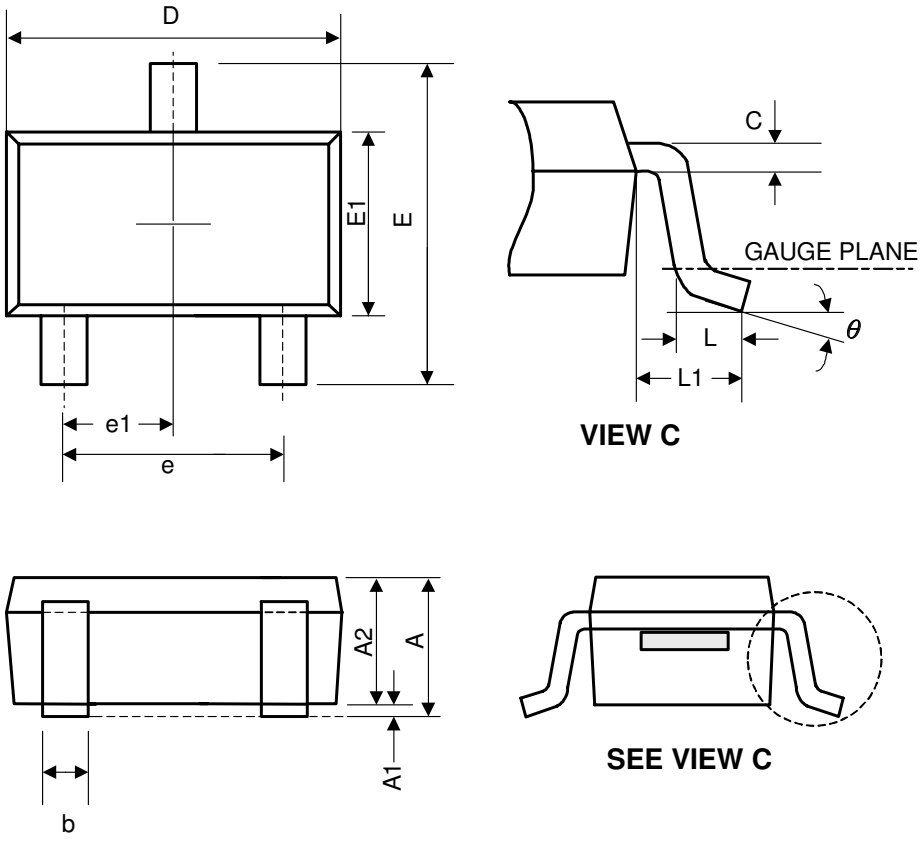
MARKING INFORMATION

SOT-23/TSOT-23



PACKAGE OUTLINES

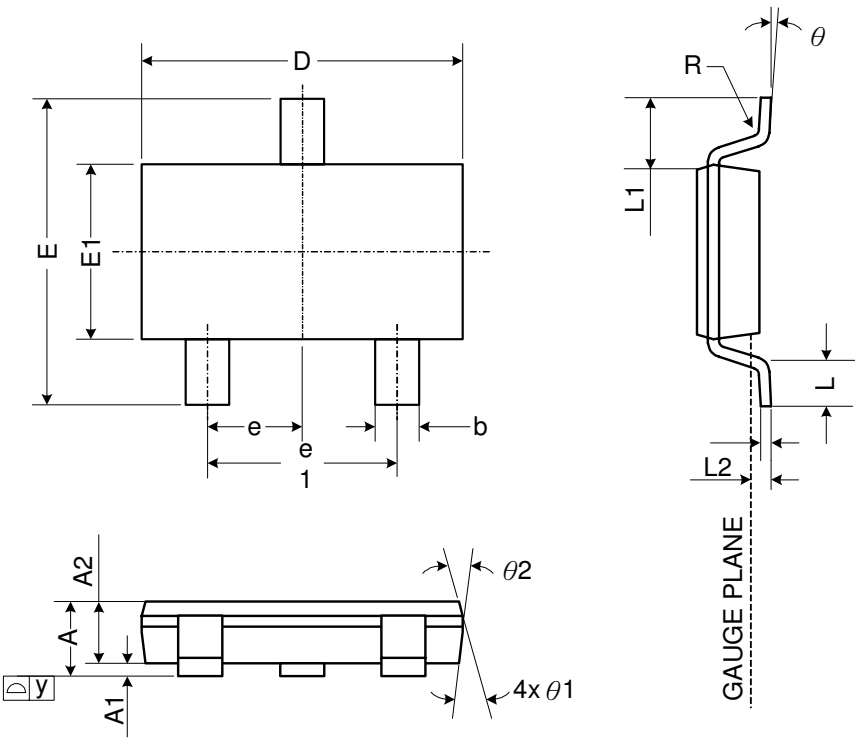
SOT-23



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	-	-	1.45	-	-	0.057
A1	0.00	0.08	0.15	-	-	0.006
A2	0.90	1.10	1.30	0.035	0.043	0.051
b	0.30	0.40	0.50	0.012	0.016	0.020
C	0.08	0.15	0.22	0.003	0.006	0.009
D	2.70	2.90	3.10	0.106	0.114	0.122
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.40	1.60	1.80	0.055	0.063	0.071
L	0.30	0.45	0.60	0.012	0.018	0.024
L1	0.50	0.60	0.70	0.020	0.024	0.028
e	1.9 BSC			0.075 BSC		
e1	0.95 BSC			0.037 BSC		
θ	0°	4°	8°	0°	4°	8°

JEDEC outline: NA

TSOT-23



Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	0.75	-	0.90	0.030	-	0.035
A1	0.00	-	0.10	0.000	-	0.004
A2	0.70	0.75	0.80	0.028	0.030	0.031
b	0.35	-	0.51	0.014	-	0.020
C	0.10	-	0.25	0.004	-	0.010
D	2.80	2.90	3.00	0.110	0.114	0.118
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.50	1.60	1.70	0.059	0.063	0.067
e	0.95 BSC.			0.037 BSC.		
e1	1.90 BSC.			0.075 BSC.		
L	0.37	-	-	0.015	-	-
L1	0.60 REF.			0.024 REF.		
L2	0.25 BSC.			0.010 BSC.		
y	-	-	0.10	-	-	0.004
R	0.10	-	-	0.004	-	-
θ	0°	-	8°	0°	-	8°
θ1	7° NOM.			7° NOM.		
θ2	5° NOM.			5° NOM.		