



**MICROPOWER, ULTRA-SENSITIVE HALL EFFECT SWITCH**

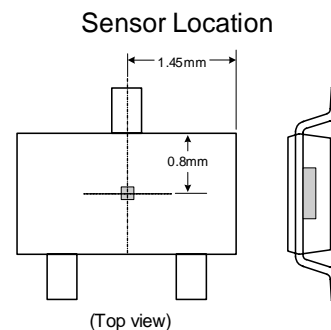
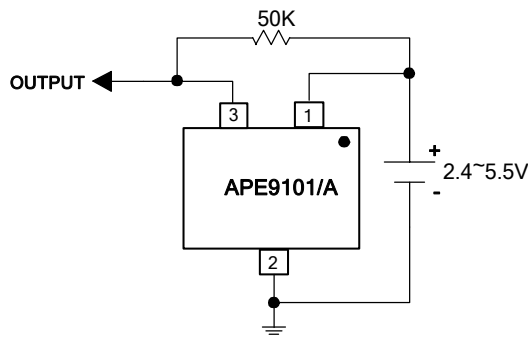
**FEATURES**

- 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

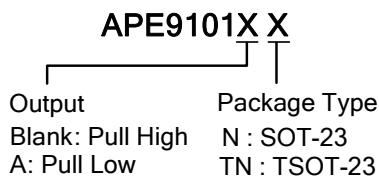
**DESCRIPTION**

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**



**ORDERING INFORMATION**



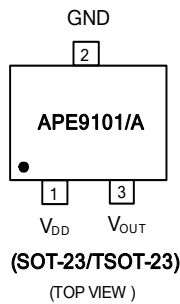


**ABSOLUTE MAXIMUM RATINGS** (at  $T_A=25^\circ\text{C}$ )

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°C To 150°C
Operating Temperature Range( $T_{OP}$ )	-----	-40°C To 85°C
Junction Temperature( $T_J$ )	-----	125°C
Thermal Resistance from Junction to Ambient( $R_{thJA}$ )		550°C/W

Note.  $R_{thJA}$  is measured with the PCB copper area of approximately 1 in<sup>2</sup>(Multi-layer).

**PACKAGE INFORMATION**



**ELECTRICAL SPECIFICATIONS**

( $V_{DD}=2.75\text{V}$ ,  $T_A=25^\circ\text{C}$ , 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	$V_{OSAT}$	$I_O=1\text{mA}$	-	0.1	0.3	V
Output Leakage Current	$I_{O-LEAK}$	$V_{OUT}=5.5\text{V}$ , $B < B_{rp}$	-	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**

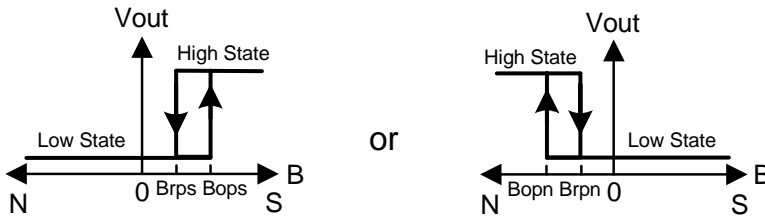
( $V_{DD} = 2.75V$ ,  $T_A = 25^\circ C$ , unless otherwise specified)

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**



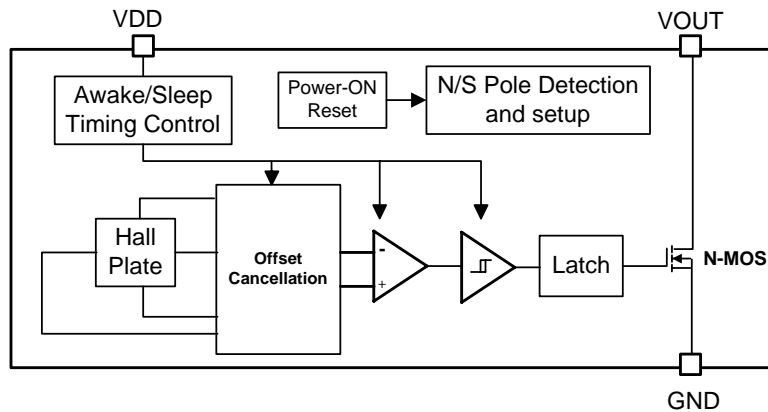
**2.APE9101A**



**PIN DESCRIPTIONS**

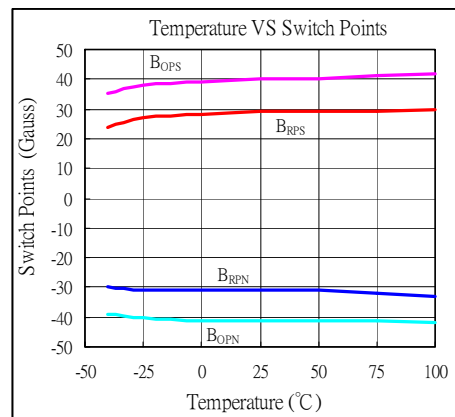
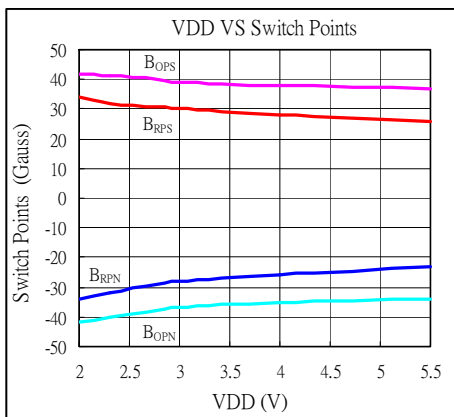
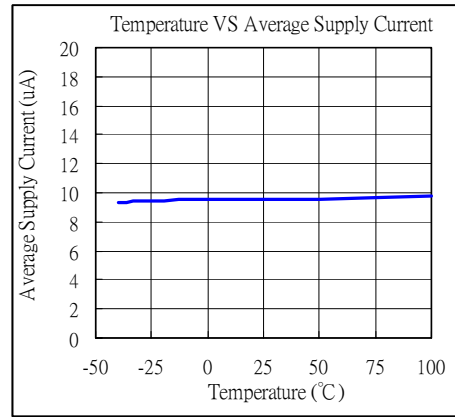
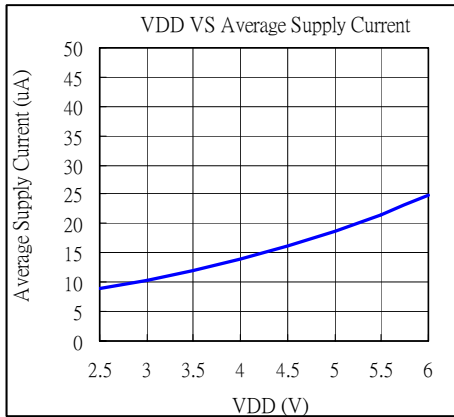
PIN SYMBOL	PIN DESCRIPTION
VDD	Power Input Pin
GND	Ground
OUTPUT	<p>APE9101</p> <p><math>B &gt; B_{ops}</math> or <math>B &lt; B_{opn}</math>, Output is Low.</p> <p><math>B &lt; B_{rps}</math> or <math>B &gt; B_{rpn}</math>, Output is High.</p> <p>APE9101A</p> <p><math>B &gt; B_{ops}</math> or <math>B &lt; B_{opn}</math>, Output is High.</p> <p><math>B &lt; B_{rps}</math> or <math>B &gt; B_{rpn}</math>, Output is Low.</p>

**BLOCK DIAGRAM**





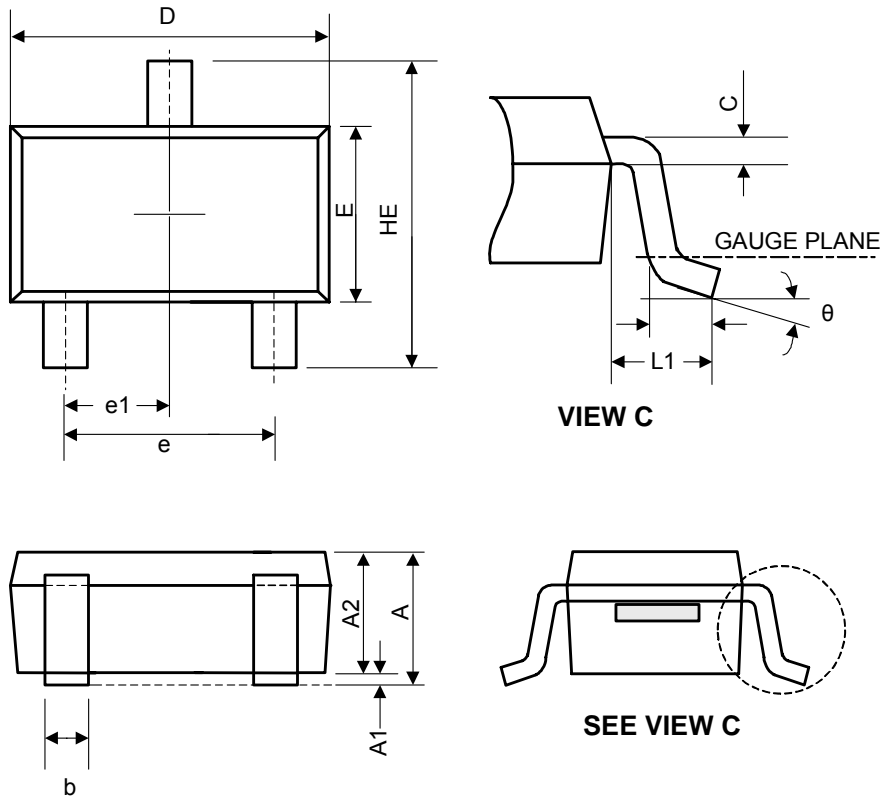
TYPICAL PERFORMANCE CHARACTERISTICS





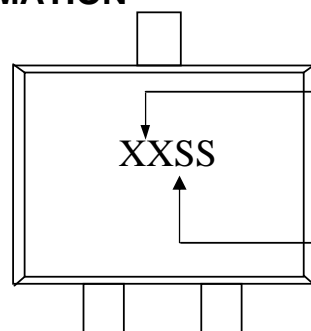
PACKAGE OUTLINES

(1) SOT-23-3L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.05	-	1.35	0.041	-	0.053
A1	0.05	-	0.15	0.002	-	0.006
A2	1.00	1.10	1.20	0.039	0.043	0.047
b	0.25	-	0.50	0.010	-	0.020
C	0.08	-	0.20	0.003	-	0.008
D	2.70	2.90	3.00	0.106	0.114	0.118
E	1.50	1.60	1.70	0.059	0.063	0.067
HE	2.60	2.80	3.00	0.102	0.110	0.118
L	0.30	-	0.60	0.012	-	0.024
L1	0.50	0.60	0.70	0.020	0.024	0.028
e	1.80	1.90	2.00	0.071	0.075	0.079
e1	0.85	0.95	1.05	0.033	0.037	0.041
θ	0°	5°	10°	0°	5°	10°

MARKING INFORMATION



Part Number :

H1 : APE9101  
H2 : APE9101A

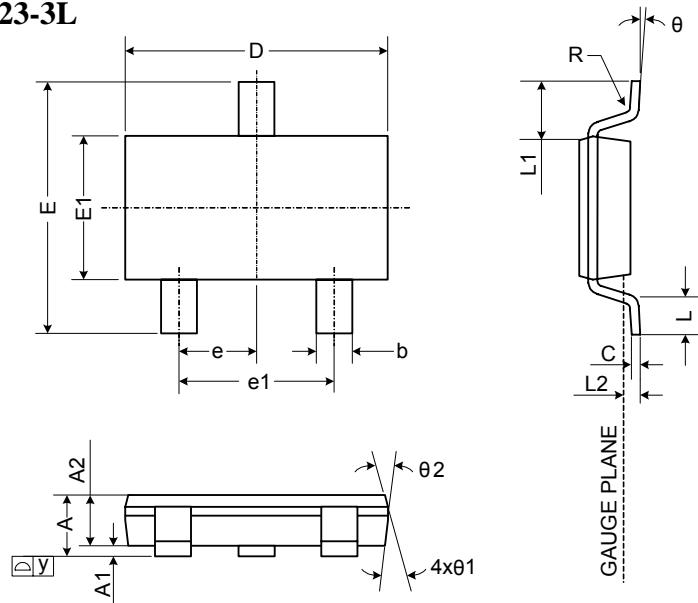
Date Code :

SS:2004,2008,2012...  
SS:2003,2007,2011...  
~~SS~~:2002,2006,2010...  
~~SS~~:2001,2005,2009...

"A~Z" showed on 3rd position --> week 1 ~ week 26,  
 "A~Z" showed on 4th position --> week 27 ~ week 52.

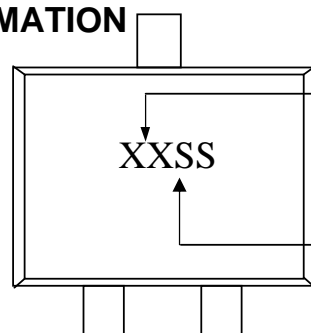


(2) TSOT-23-3L



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		
e1	1.90 BSC.			0.075		
L	0.37	-	-	0.015	-	-
L1	0.60 REF.			0.024		
L2	0.25 BSC.			0.010		
y	-	-	0.10	-	-	0.004
R	0.10	-	-	0.004	-	-
theta	0°	-	8°	0°	-	8°
theta1	7° NOM.			7° NOM.		
theta2	5° NOM.			5° NOM.		

MARKING INFORMATION



Part Number :

H1 : APE9101  
H2 : APE9101A

Date Code :

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SS:2003,2007,2011...  
SS:2002,2006,2010...  
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