

# AH443 AH441

## HALL-EFFECT SWITCH INTEGRATED CIRCUITS

These Hall-effect switches are monolithic integrated circuits with tighter magnetic specifications and high sensitivity, designed to operate continuously over extended temperatures to +150° and are more stable with C, both temperature and supply voltage changes. The unipolar switching characteristic makes these devices ideal for use with a simple bar or rod magnet.

Each device includes a voltage regulator for operation with supply voltages of 4.5 to 24 volts, reverse battery protection diode, quadratic Hall-voltage generator, temperature compensation circuitry, small-signal amplifier, Schmitt trigger, and an open-collector output to sink up to 25 mA. With suitable output pull up, they can be used with bipolar or CMOS logic circuits.

### FEATURES

Wide Supply Voltage Range  
Fast Response Time  
Wide Frequency And Temperature Range  
Long Operating Life  
Small Size, Convenient Installing  
Output Compatible With All Digital Logic families

### TYPICAL APPLICATIONS

Contactless Switch . Position Control  
Speed Measurement . Revolution Detection  
Isolation Measurement . Brushless DC Motor  
Automotive Ignitor

### ABSOLUTE MAXIMUM RATING

Parameter	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	24	V
Magnetic Flux Density	B	Unlimited	mT
Output OFF Voltage	V <sub>ce</sub>	40	V
Continuous Output Current	I <sub>OL</sub>	25	mA
Operating Temperature Range	T <sub>A</sub>	-40~150	°C
Storage Temperature Range	T <sub>S</sub>	-55~150	°C

### ELECTRICAL CHARACTERISTICS

T<sub>A</sub>=25°C

Parameter	Symbol	Test condition	Type and Value			Unit
			min	typ	max	
Supply Voltage	V <sub>CC</sub>		4.5	-	24	V
Output Saturation Voltage	V <sub>OL</sub>	I <sub>out</sub> =15mA B>B <sub>OP</sub>	-	200	400	mV
Output Leakage Current	I <sub>OH</sub>	V <sub>out</sub> =24V B<B <sub>RP</sub>	-	0.1	10	μA
Supply Current	I <sub>CC</sub>	V <sub>CC</sub> =24V Output Open	-	-	10	mA
Output Rise Time	t <sub>r</sub>	R <sub>L</sub> =820Ω C <sub>L</sub> =20PF	-	0.12	-	μS
Output Fall Time	t <sub>f</sub>	R <sub>L</sub> =820Ω C <sub>L</sub> =20PF	-	0.18	-	μS

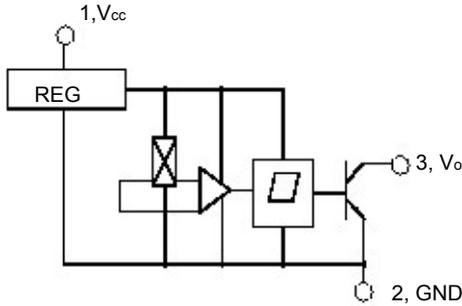
### MAGNET CHARACTERISTICS

V<sub>CC</sub>=4.5~24V

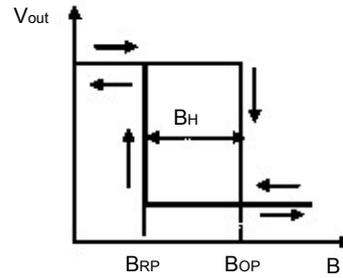
Parameter	Symbol	AH443			AH441			Unit
		min	typ	max	min	typ	max	
Operate Point	B <sub>OP</sub>	-	-	20	-	-	11	mT
Release Point	B <sub>RP</sub>	5	-	-	2	-	-	mT
Hysteresis	B <sub>H</sub>	4	-	-	4	-	-	mT

NOTE: 1mT=10GS

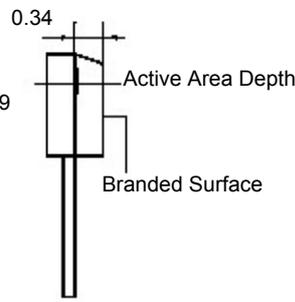
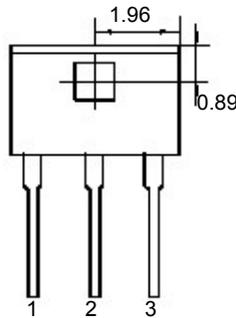
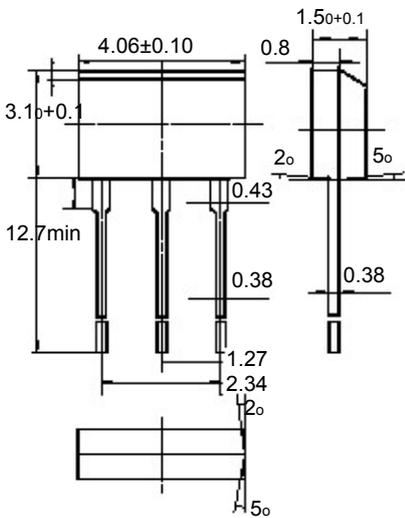
### BLOCK DIAGRAM



### MAGNETIC-ELECTRICAL TRANSFER CHARACTERISTICS

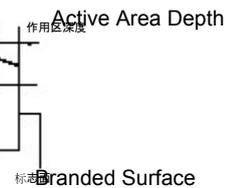
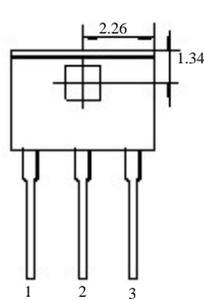
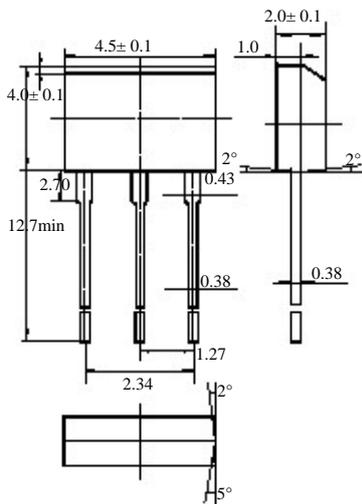


### DIMENSIONS (in: mm)



1. V<sub>CC</sub> 2. GND 3. OUTPUT

TO-92UA Package and Active Area



1. V<sub>CC</sub> 2. GND 3. OUTPUT

TO-92T Package and Active Area

### Cautions

1. When install, should as full as possible decrease the mechanical stress acting on the Hall IC, to avoid the influence of the operate point and release point.
2. On the premise of ensuring welding quality, use as possible as low welding temperature as short time.

