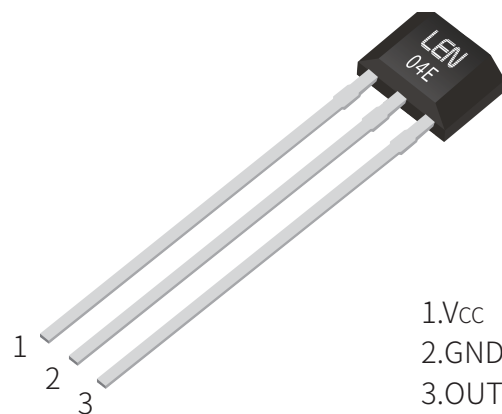


Descriptions

A1104EUA-T is integrated Hall-effect latched sensor designed for electronic commutation of brushless DC motor applications. The device includes a voltage regulator for operation with supply voltages of 3.5V to 28V, quadratic Hall-voltage generator, temperature compensation circuitry, small-signal amplifier, Schmitt trigger, and an open-collector output to sink up to 25mA.



TO-92S

Features

- ◇ On-chip Hall Sensor
- ◇ Maximum Output Sink Current: 25mA
- ◇ Operating Temperature: -40°C to 150°C
- ◇ ESD Rating: 4000V (HBM) and 400V (MM)
- ◇ Wide Operating Voltage Range: 3.5V to 28V
- ◇ Internal Bandgap Regulator for Temperature Compensation

Applications

- ◇ Flow-rate sensing
- ◇ Motor and fan control
- ◇ Auto-motive transmission position
- ◇ Speed and RPM (revolutions per minute) sensing

Ordering Information

Part Number	Package	Shipping Quantity
A1104EUA-T	TO-92S	500 pcs / Bag , 4000 pcs / Box

Absolute Maximum Ratings (T_A=25°C)

Parameter	Symbol	Ratings	Unit
Supply Voltage	V _{CC}	40	V
Reverse Supply Voltage	V _{RCC}	-20	V
Output off Voltage	V _{OUT}	55	V
Reverse Output Voltage	V _{ROUT}	-0.3	V
Output Sink Current (Continuous Current)	I _{OUT}	25	mA
Power Dissipation	P _D	400	mW
Operating Temperature Range	T _{OPR}	-40 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C
Human Body Mode (HBM) *1	V _{ESD(HBM)}	±4000	V
Machine Mode (MM) *1	V _{ESD(MM)}	±400	V
UA Package Thermal Resistance	R _{θJA}	166	°C/W

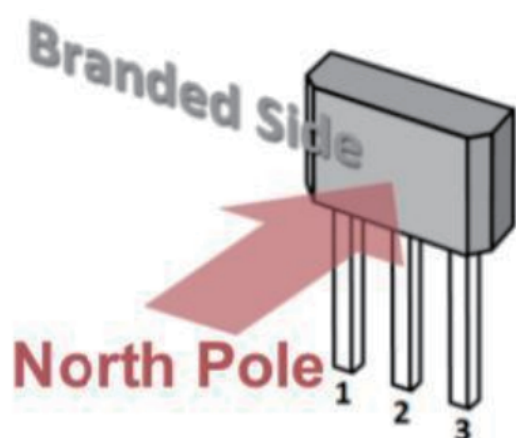
Notes: (*1) Human Body Model and Machine Model tests according to: standard AEC-Q100-002 and AEC-Q100-003 respectively.

(*2) Stresses above those listed here may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

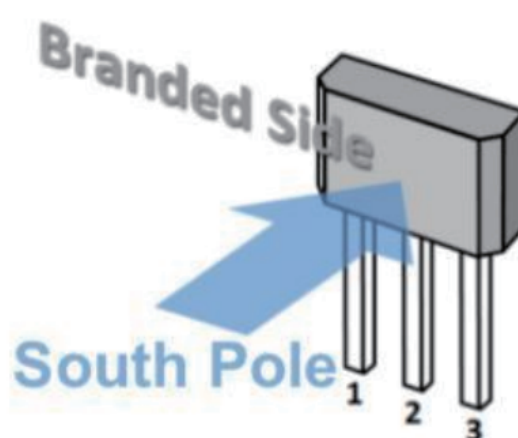
Characteristics ($T_A=25^{\circ}\text{C}$, $V_{DD} = 5\text{V}$)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating voltage	V_{CC}	$T_J < T_J(\text{Max})$	3.5		28	V
Supply Current	I_{CC}	$V_{CC}=3.5$ to 28V		3.5	8	mA
Off-State Leakage Current	I_{LEAK}	Output Hi-Z		<0.1	10	μA
Output Saturation Voltage	V_{SAT}	$I_{OUT}=20\text{mA}$		110	300	mV
Rise Time	T_R	$R_L=1\text{K}\Omega$ $C_S=20\text{pF}$		0.4	1.5	μs
Fall Time	T_F	$R_L=1\text{K}\Omega$ $C_S=20\text{pF}$		0.15	1.5	μs
Operate Point	B_{OP}	4.5V to 24V with 20mA load unles	200	260	330	Gs
Release Point	B_{RP}	4.5V to 24V with 20mA load unles	150	210	300	Gs
Hysteresis	B_{HYS}	4.5V to 24V with 20mA load unles	20	50	80	Gs

Definition of Switching Function

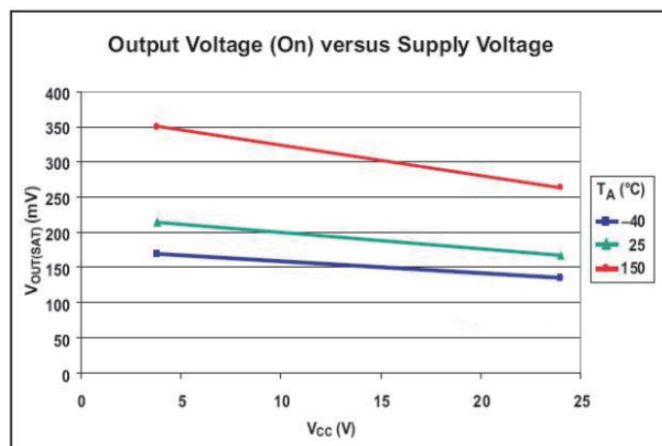
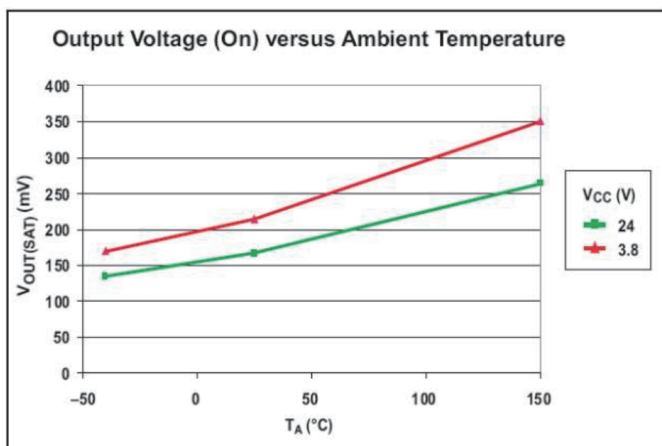
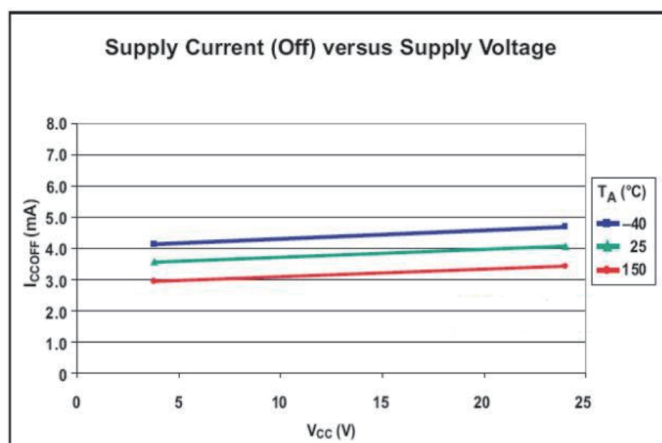
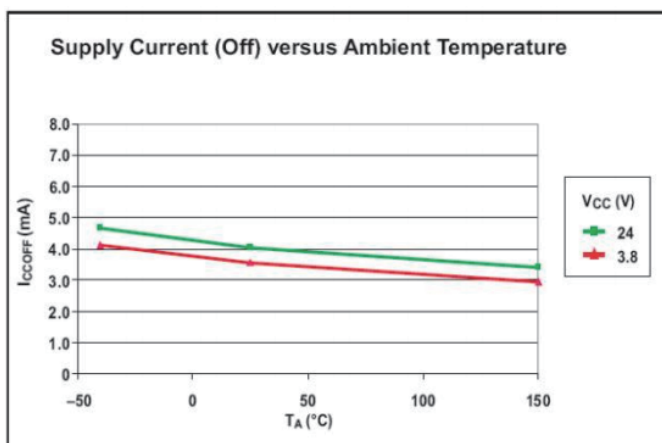
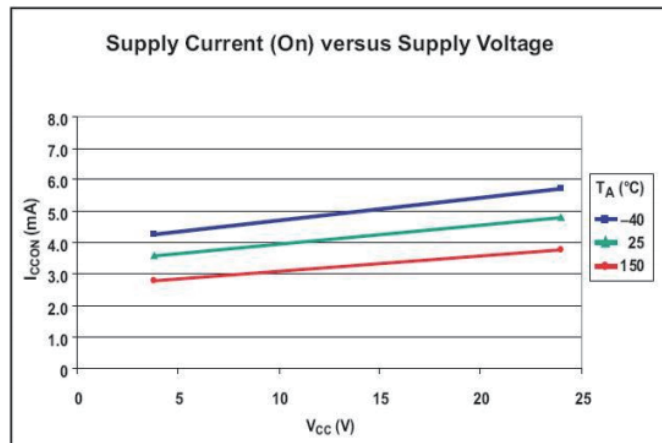
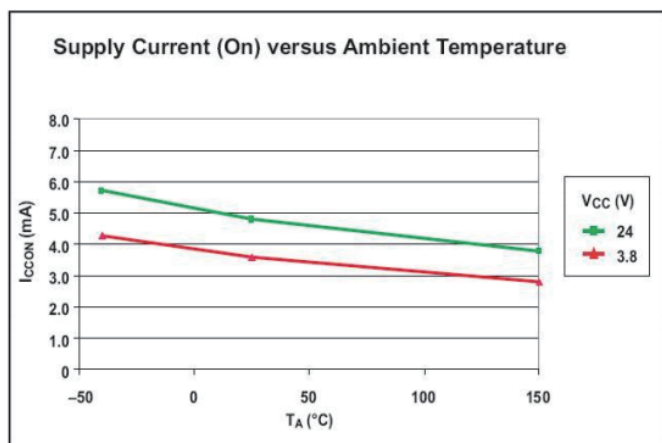


OUT=High

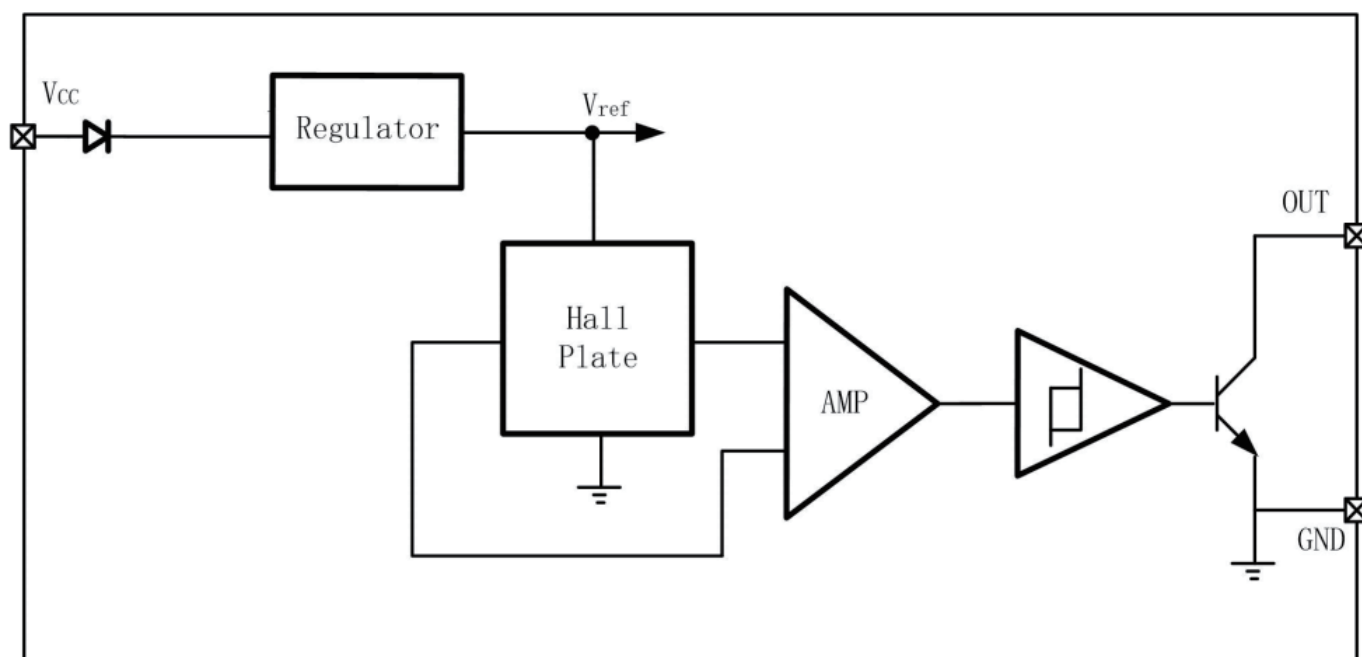


OUT= $V_{DS(on)}$

Basic Characteristics



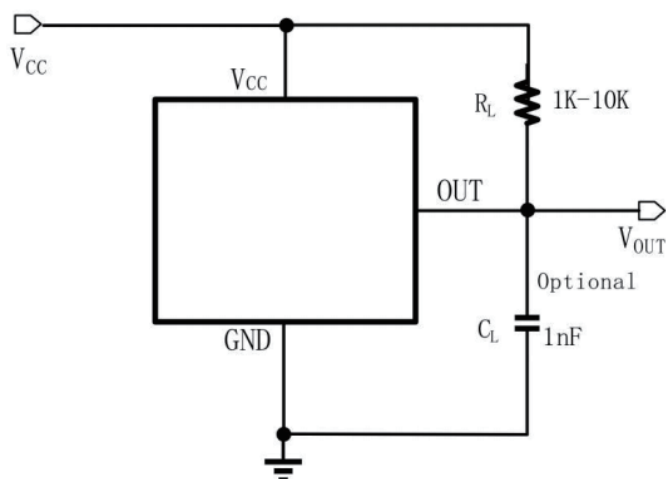
Function Block



The output of the **A1104EUA-T** switches low (turns on) when a magnetic field perpendicular to the Hall element exceeds the operate point threshold, B_{OP} . When the magnetic field is reduced below the release point, B_{RP} , the device output goes high (turns off). The difference between the magnetic operate point and release point is the hysteresis, B_{HYS} , of the device. This built-in hysteresis allows clean switching of the output, even in the presence of external mechanical vibration and electrical noise.

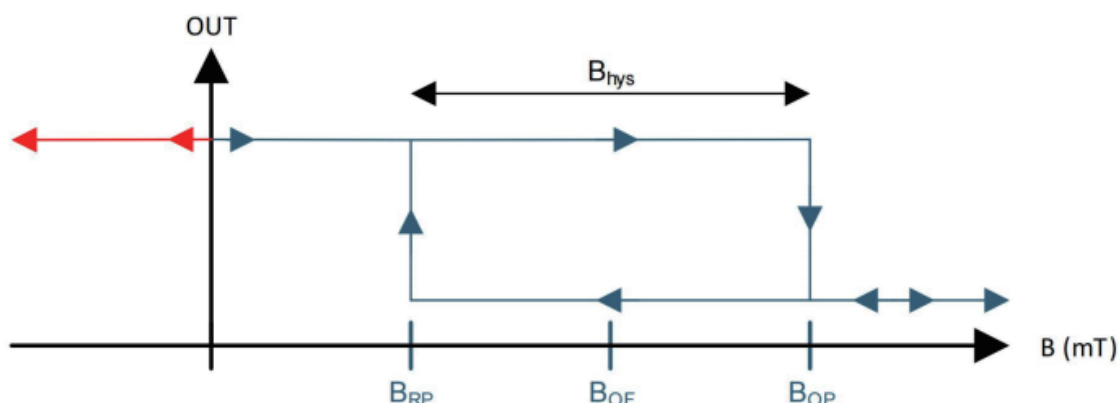
Powering-on the device in the hysteresis range, less than B_{OP} and higher than B_{RP} , allows an indeterminate output state. The correct state is attained after the first excursion beyond B_{OP} or B_{RP} .

Typical Application



The **A1104EUA-T** contains an on-chip voltage regulator and can operate over a wide supply voltage range. In applications that operate the device from an unregulated power supply, transient protection must be added externally. For applications using a regulated line, EMI/RFI protection may still be required. It is recommended to shunt C1 capacitors to the ground near the chip Vcc power supply, with a typical value of 0.1 μ F. At the same time in the external optional series resistor R1 their typical values for 100 Ω . The output capacitor CL is used as the output filter, typically 1nF.

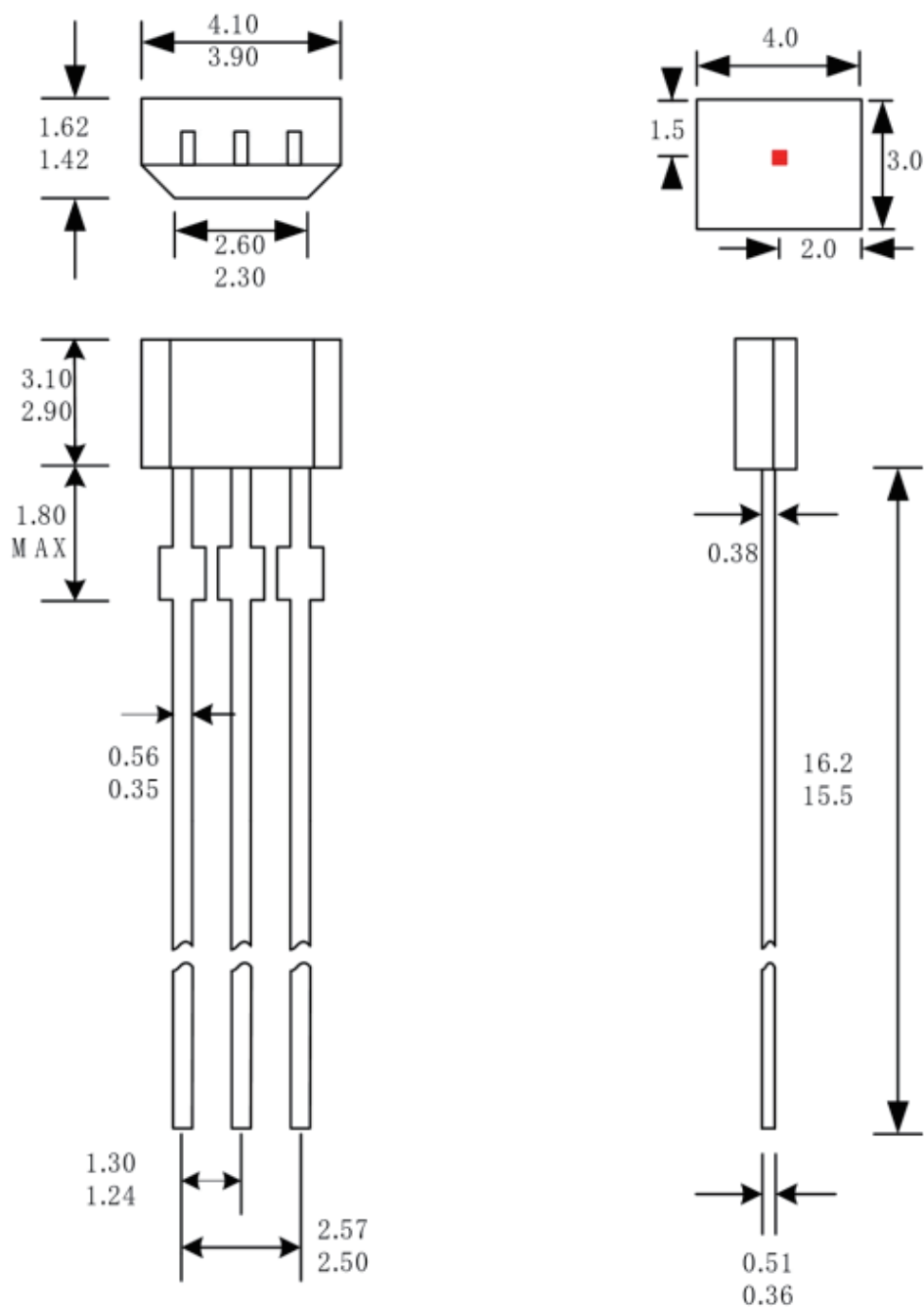
Transfer Function



Powering-on the device in the hysteresis region, less than BOP and higher than BRP, allows an indeterminate output state. The correct state is attained after the first excursion beyond BOP or BRP. If the field strength is greater than BOP, then the output is pulled low. If the field strength is less than BRP, the output is released.

Package Dimensions

TO-92S



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