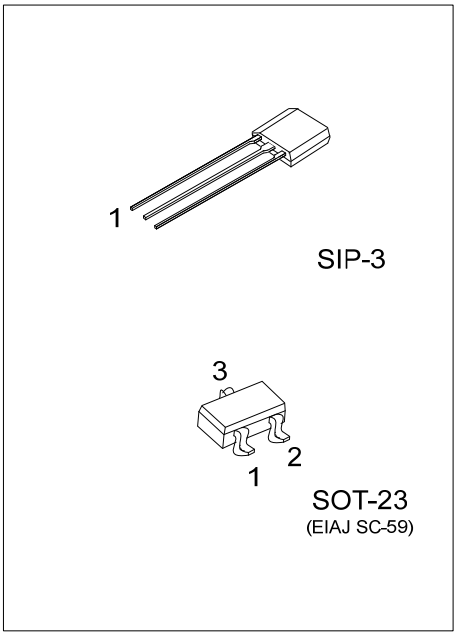
UHC188

CMOS IC

SINGLE OUTPUT HALL EFFECT LATCH



■ DESCRIPTION

UTC **UHC188** is an integrated Hall effect latched sensor designed for electronic commutation of brush-less DC motor applications. The device using HVCMOS process includes an on-chip Hall voltage generator for magnetic sensing, a comparator that amplifies the Hall voltage, and a Schmitt trigger to provide switching hysteresis for noise rejection, and open-collector output. An internal band-gap regulator is used to provide temperature compensated supply voltage for internal circuits and allows a wide operating supply range.

If a magnetic flux density larger than threshold Bop, OUT is turned on (low). The output state is held until a magnetic flux density reversal falls below Brp causing OUT to be turned off (high).

■ FEATURES

* 2.8V~30V DC operation voltage
* Temperature compensation
* Wide operating voltage range
* Open-Drain pre-driver
* 25mA maximum sinking output current.

■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UHC188L-AE3-R	UHC188G-AE3-R	SOT-23	I	O	G	Tape Reel
UHC188L-G03-B	UHC188G-G03-B	SIP-3	I	G	O	Tape Box
UHC188L-G03-K	UHC188G-G03-K	SIP-3	I	G	O	Bulk

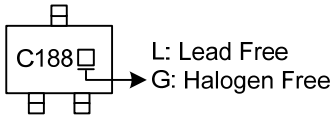
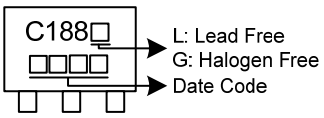
Note: Pin Assignment: I: V_{DD} G: GND O: Output

UHC188G-AE3-R

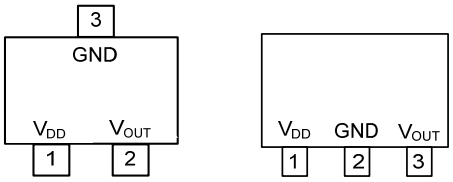
(1) Packing Type
(2) Package Type
(3) Green Package

(1) R: Tape Reel, B: Tape Box, K: Bulk
(2) AE3: SOT-23, G03: SIP-3
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

SOT-23	SIP-3
	

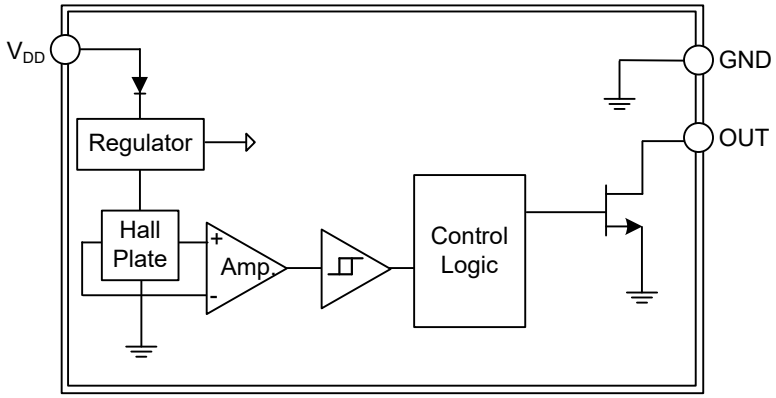
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NAME	DESCRIPTION
V_{DD}	Supply voltage
GND	Ground
Output	Output voltage

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	32	V
Reverse V_{CC} Polarity Voltage		V_{RCC}	-32	V
Magnetic Flux Density		B	Unlimited	Gauss
Output Current	Continuous	I_O	25	mA
Power Dissipation	SOT-23	P_D	200	mW
	SIP-3		400	mW
Ambient Temperature		T_A	-40 ~ +125	°C
Storage Temperature Range		T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS (V_{DD}=12V , T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{DD}	Operating	2.8		30	V
Supply Current	I_{DD}	Operating		3.0	4.5	mA
Output Leakage Current	I_{OFF}	V_{OUT} = 12V		< 0.1	10	uA
Output Saturation Voltage	$V_{DS(SAT)}$	I_{OUT}=20mA		0.3		V

■ MAGNETIC CHARACTERISTICS (V_{DD}=12V, T_A=25°C, unless otherwise specified)

For UHC188-A

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operate Point, BOP	B_{OP}	B>B_{OP}, V_{OUT} On	5	20	40	Gauss
Release Point, BRP	B_{RP}	B<B_{RP}, V_{OUT} Off	-40	-20	-5	Gauss
Hysteresis	B_{HY}	|BOP - BRP|		40		Gauss

For UHC188-B

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operate Point, BOP	B_{OP}	B>B_{OP}, V_{OUT} On	5	35	60	Gauss
Release Point, BRP	B_{RP}	B<B_{RP}, V_{OUT} Off	-60	-35	-5	Gauss
Hysteresis	B_{HY}	|BOP - BRP|		70		Gauss

Note: 1mT=10 Gauss.

■ DRIVER OUTPUT VS. MAGNETIC POLE

For SIP3

PARAMETER	TEST CONDITIONS	DO
North Pole	B < Brp	High
South Pole	B > Bop	Low

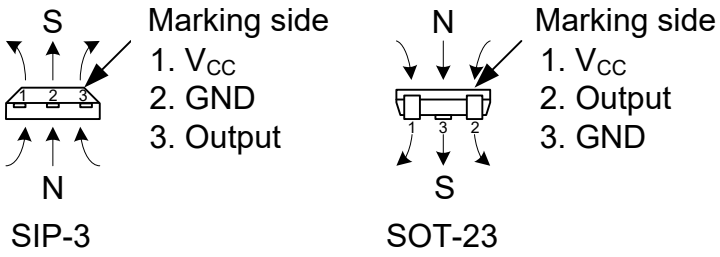
Note: The magnetic pole is applied facing the branded side of the SIP-3 package.

For SOT-23

PARAMETER	TEST CONDITIONS	DO
North Pole	B > Bop	Low
South Pole	B < Brp	High

Note: The magnetic pole is applied facing the branded side of the SOT-23 package.

■ CHYSTERESIS CHARACTERISTICS



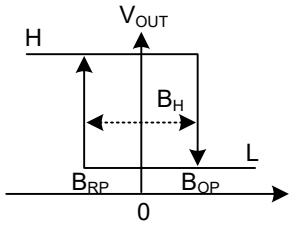
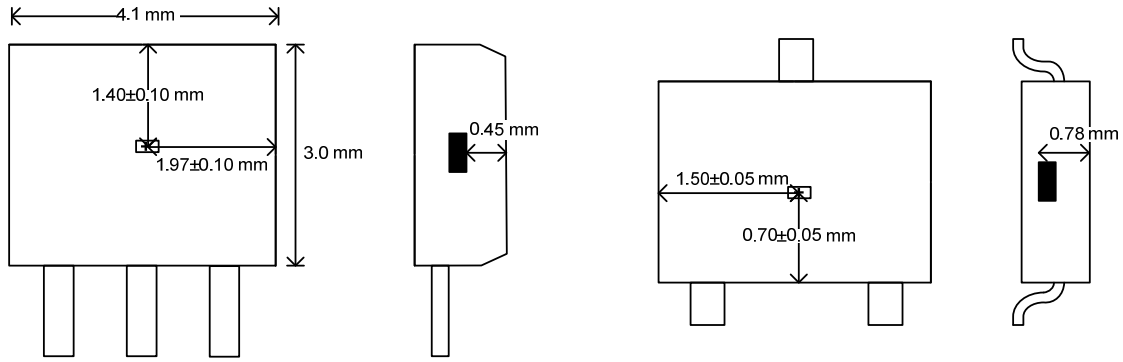


Figure 1. Applying Direction of Magnetic Flux

■ TEST CIRCUIT



■ TYPICAL APPLICATION CIRCUIT