



## UHC188

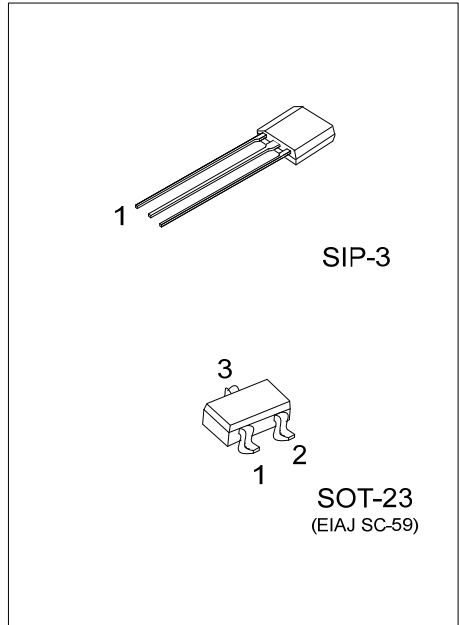
CMOS IC

### 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  $B_{op}$ , OUT is turned on (low). The output state is held until a magnetic flux density reversal falls below  $B_{rp}$  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.

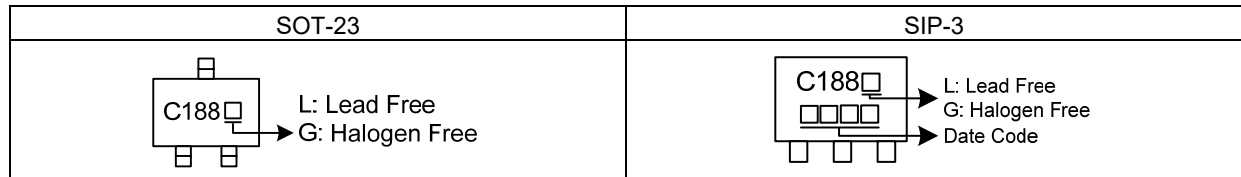
#### ORDERING INFORMATION

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

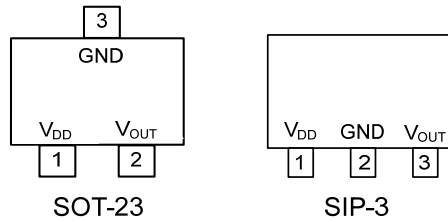
Note: Pin Assignment: I:  $V_{DD}$  G: GND O: Output

<p>UHC188G-AE3-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(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</p>
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MARKING



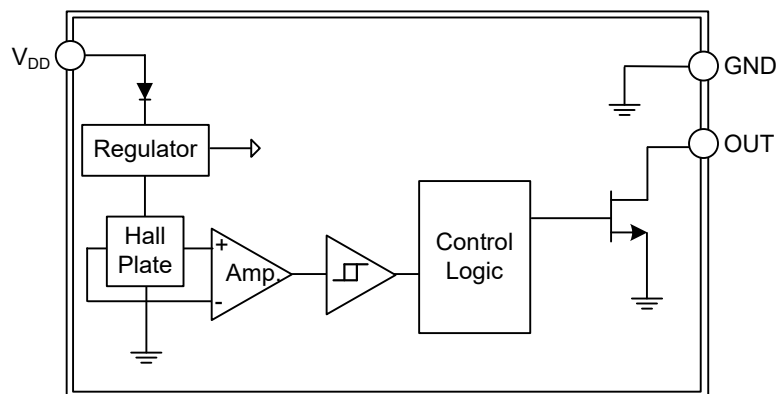
PIN CONFIGURATION



PIN DESCRIPTION

PIN NAME	DESCRIPTION
V <sub>DD</sub>	Supply voltage
GND	Ground
Output	Output voltage

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T<sub>A</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V <sub>CC</sub>	32	V
Reverse V <sub>CC</sub> Polarity Voltage		V <sub>RCC</sub>	-32	V
Magnetic Flux Density		B	Unlimited	Gauss
Output Current	Continuous	I <sub>O</sub>	25	mA
Power Dissipation	SOT-23	P <sub>D</sub>	200	mW
	SIP-3		400	mW
Ambient Temperature		T <sub>A</sub>	-40 ~ +125	°C
Storage Temperature Range		T <sub>STG</sub>	-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<sub>DD</sub>=12V, T<sub>A</sub>=25°C, unless otherwise specified)

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

■ MAGNETIC CHARACTERISTICS (V<sub>DD</sub>=12V, T<sub>A</sub>=25°C, unless otherwise specified)

**For UHC188-A**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operate Point, BOP	B <sub>OP</sub>	B > B <sub>OP</sub> , V <sub>OUT</sub> On	5	20	40	Gauss
Release Point, BRP	B <sub>RP</sub>	B < B <sub>RP</sub> , V <sub>OUT</sub> Off	-40	-20	-5	Gauss
Hysteresis	B <sub>HY</sub>	B <sub>OP</sub> - B <sub>RP</sub>		40		Gauss

**For UHC188-B**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operate Point, BOP	B <sub>OP</sub>	B > B <sub>OP</sub> , V <sub>OUT</sub> On	5	35	60	Gauss
Release Point, BRP	B <sub>RP</sub>	B < B <sub>RP</sub> , V <sub>OUT</sub> Off	-60	-35	-5	Gauss
Hysteresis	B <sub>HY</sub>	B <sub>OP</sub> - B <sub>RP</sub>		70		Gauss

Note: 1mT=10 Gauss.

■ DRIVER OUTPUT VS. MAGNETIC POLE

**For SIP3**

PARAMETER	TEST CONDITIONS	DO
North Pole	B < B <sub>rp</sub>	High
South Pole	B > B <sub>op</sub>	Low

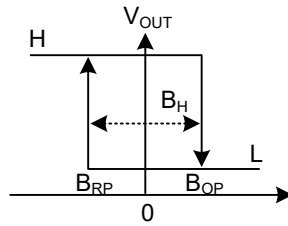
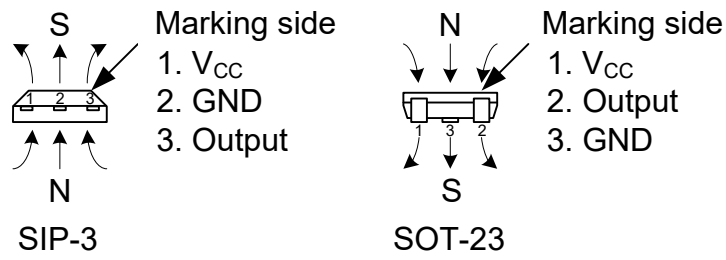
Note: The magnetic pole is applied facing the branded side of the SIP-3 package.

**For SOT-23**

PARAMETER	TEST CONDITIONS	DO
North Pole	B > B <sub>op</sub>	Low
South Pole	B < B <sub>rp</sub>	High

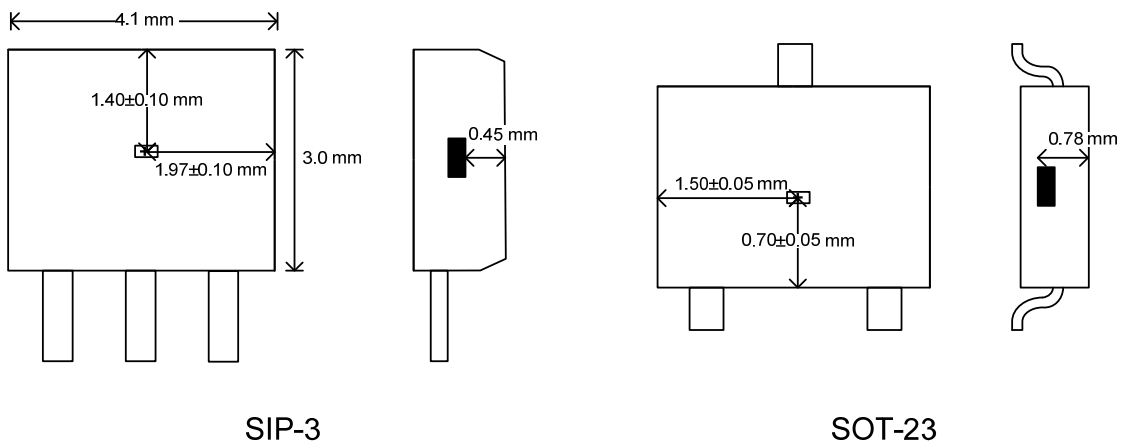
Note: The magnetic pole is applied facing the branded side of the SOT-23 package.

■ CHYSTERESIS CHARACTERISTICS

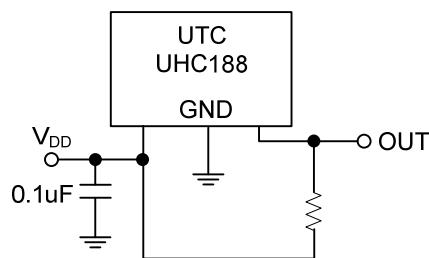


Magnetic Flux Density  
 Figure 1. Applying Direction of Magnetic Flux

■ TEST CIRCUIT



■ TYPICAL APPLICATION CIRCUIT



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