



## UH288F/R

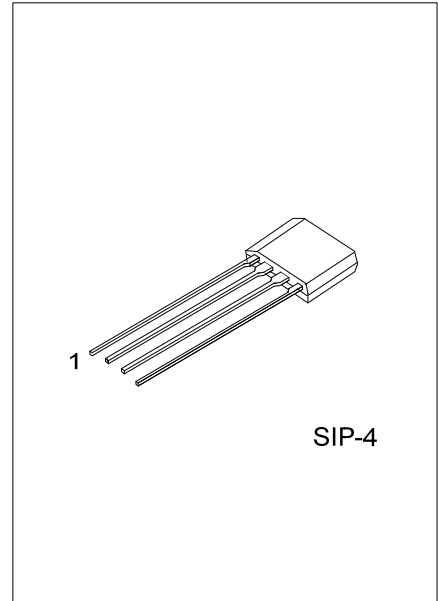
## LINEAR INTEGRATED CIRCUIT

### COMPLEMENTARY OUTPUT HALL EFFECT FAN DRIVER

#### DESCRIPTION

UTC **UH288F**(FG)/**UH288R**(RD) are integrated Hall sensors with output drivers, mainly designed for electronic commutation of brush-less DC Fan. This IC is using HV BCD process internally includes the regulator, protecting diode, Hall plate, amplifier, comparator, and a pair of complementary open-Drain outputs (DO, DOB).

To avoid coil burning, rotor-lock shutdown detection circuit shut down the output driver if the rotor is blocked and then the automatic recovery circuit will try to restart the motor. This function repeats while rotor is blocked. Until the blocking is removed, the motor recovers running normally.



#### FEATURES

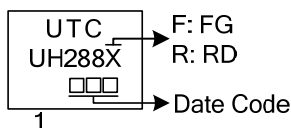
- \* Wide operating voltage range: 4V~28V
- \* Output sink current up to 0.3A
- \* On-Chip High sensitivity Hall-effect Sensor
- \* Thermal Shutdown Protection
- \* Low Output Switching Current Noise
- \* -40°C ~ 85°C Operating Temperature
- \* Rotor-locked shutdown and automatically restart function
- \* For 12V and 24V DC motor / FAN systems

#### ORDERING INFORMATION

Ordering Number	Package	Packing
UH288FG-G04-K	SIP-4	Bulk
UH288RG-G04-K	SIP-4	Bulk

<p>UH288FG-G04-K</p> <p>(1) Packing Type (2) Package Type (3) Green Package (4) Output Type</p>	<p>(1) K: Bulk (2) G04: SIP-4 (3) G: Halogen Free and Lead Free (4) F: FG, R: RD</p>
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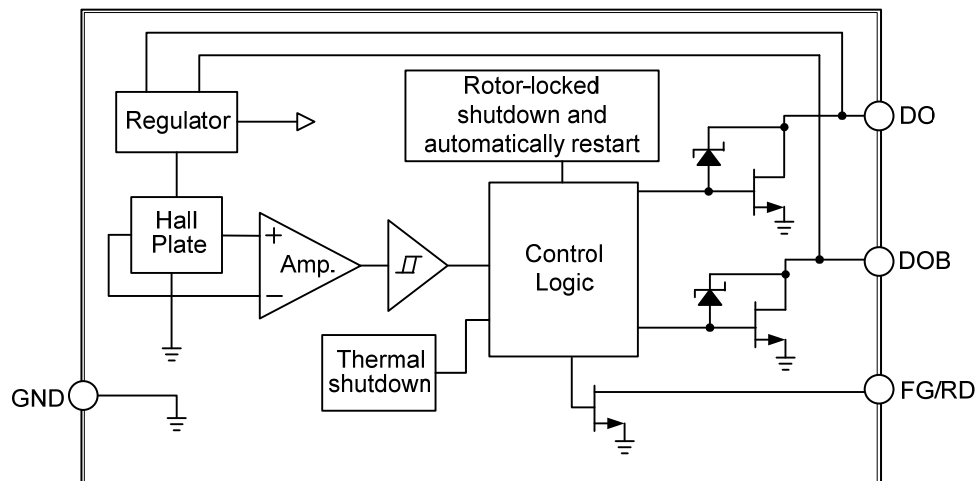
#### MARKING



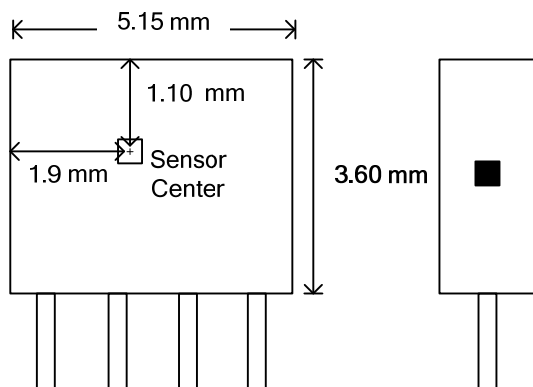
## ■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	FG/RD	Frequency Generator / Rotation Detection Output
2	DO	Output 1
3	DOB	Output 2
4	GND	Ground.

## ■ BLOCK DIAGRAM



## ■ SENSOR LOCATIONS



■ ABSOLUTE MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Fan Supply Voltage		$V_{CC}$	28	V
FG/RD Voltage		$V_{FG}$	28	V
FG/RD Sink Current		$I_{FG}$	20	mA
Magnetic Flux Density		B	Unlimited	Gauss
Output Current	Continuous	$I_O$	300	mA
	Hold		500	
	Peak (start up)		700	
Power Dissipation		$P_D$	550	mW
Ambient Temperature		$T_A$	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature Range		$T_{STG}$	-65 ~ +150	$^{\circ}\text{C}$

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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	227	$^{\circ}\text{C}/\text{W}$
Junction to case	$\theta_{JC}$	49	$^{\circ}\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS ( $V_{DD}=12\text{V}$ ,  $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{DD}$	Operating	4		28	V
Supply Current	$I_{DD}$	Operating		3.5	5	mA
Output Leakage Current	$I_{OFF}$	$V_{OUT}=12\text{V}$		< 0.1	10	$\mu\text{A}$
Output On Resistance	$R_{DS(ON)}$	$I_{OUT}=200\text{mA}$		2.3		$\Omega$
Output Clamping Voltage	$V_Z$	DO, DOB		58		V
FG/RD OFF Leakage Current					1	$\mu\text{A}$
FG/RD ON Saturation Voltage $V_{ON}$		10mA			0.5	V
Locked Protection On	$T_{Irp-on}$			0.45		Sec
Locked Protection Off	$T_{Irp-off}$			2.7		Sec
Thermal Shutdown Temp	$T_{SD}$		150			$^{\circ}\text{C}$
Thermal SHUTDOWN Hysteresis	$T_{SH}$			30		$^{\circ}\text{C}$

■ MAGNETIC CHARACTERISTICS ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

(1mT=10Gauss)

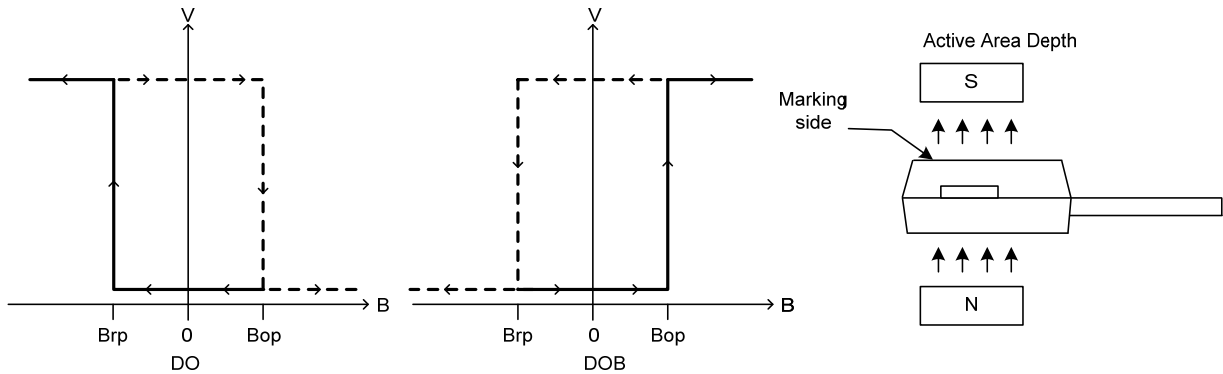
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Operate Point	$B_{OP}$	5	30	50	Gauss
Release Point	$B_{RP}$	-50	-30	-5	Gauss
Hysteresis	$B_{HYS}$		60		Gauss

■ DRIVER OUTPUT VS. MAGNETIC POLE

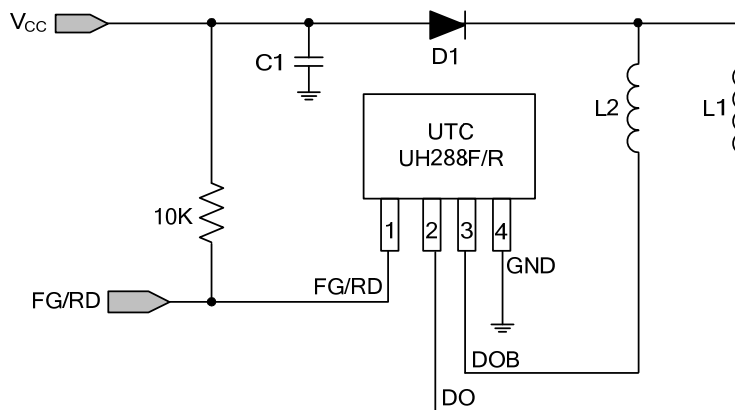
CHARACTERISTICS	TEST CONDITIONS	DO	DOB
North pole	$B < B_{rp}$	High	Low
South pole	$B > B_{op}$	Low	High

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

## ■ CHYSTERESIS CHARACTERISTICS



## ■ TYPICAL APPLICATION CIRCUIT



**12V brush-less DC fan**

- Notes: 1. C1 (Optional) is for power stabilization, Recommended E-Cap 1uF/50V  
 2. D1 (Optional) is a reverse protect diode.

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