



UH288F/R

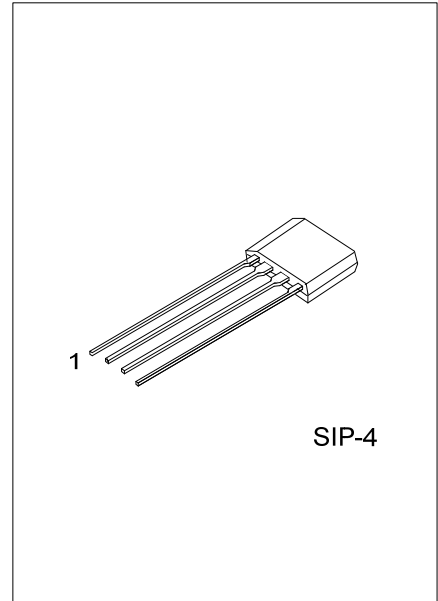
LINEAR INTEGRATED CIRCUIT

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

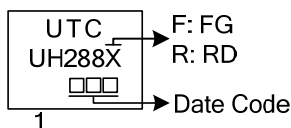
- * Wide operating voltage range: 4V~28V
- * Output sink current up to 0.3A
- * On-Chip High sensitivity Hall-effect Sensor
- * Thermal Shutdown Protection
- * Low Output Switching Current Noise
- * -40°C ~ 85°C Operating Temperature
- * Rotor-locked shutdown and automatically restart function
- * For 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) K: Bulk (2) G04: SIP-4 (3) G: Halogen Free and Lead Free (4) F: FG, R: RD</p>
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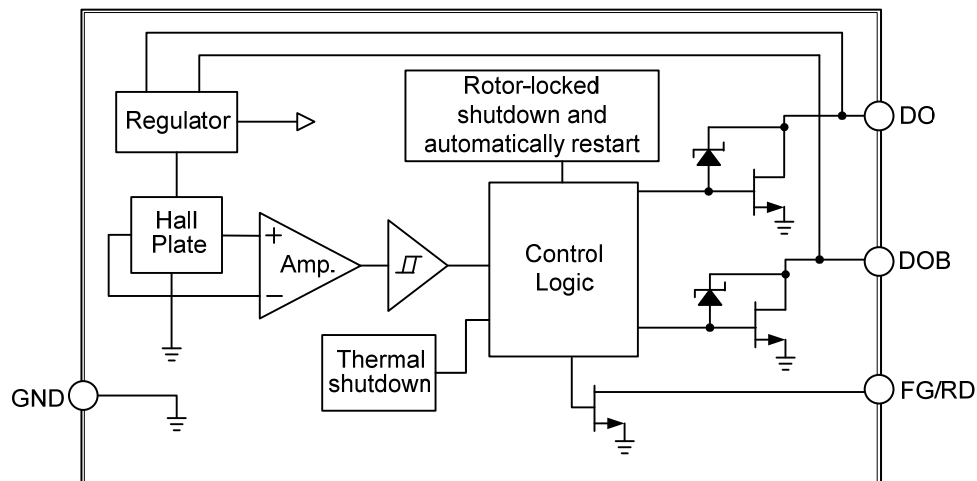
MARKING



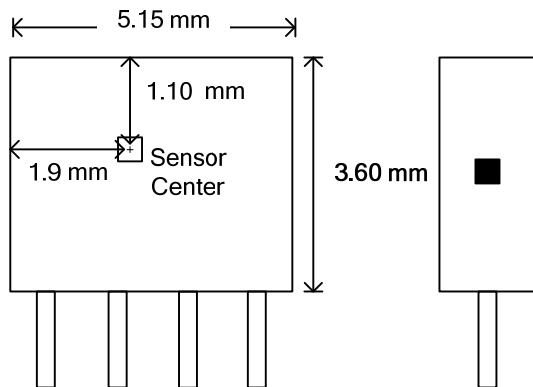
■ PIN DESCRIPTION

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	θ_{JA}	227	$^{\circ}\text{C}/\text{W}$
Junction to case	θ_{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	μA
Output On Resistance	$R_{DS(ON)}$	$I_{OUT}=200\text{mA}$		2.3		Ω
Output Clamping Voltage	V_Z	DO, DOB		58		V
FG/RD OFF Leakage Current					1	μA
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)

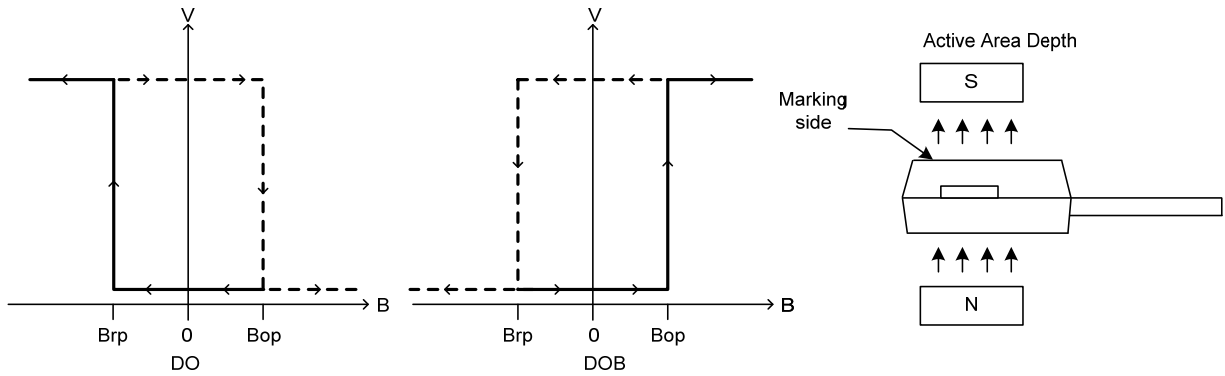
PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Operate Point	B_{OP}	5	30	50	Gauss
Release Point	B_{RP}	-50	-30	-5	Gauss
Hysteresis	B_{HYS}		60		Gauss

■ DRIVER OUTPUT VS. MAGNETIC POLE

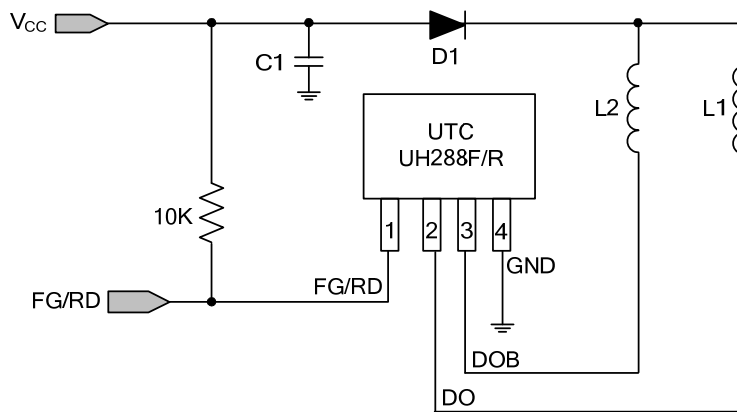
CHARACTERISTICS	TEST CONDITIONS	DO	DOB
North pole	$B < B_{rp}$	High	Low
South pole	$B > B_{op}$	Low	High

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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