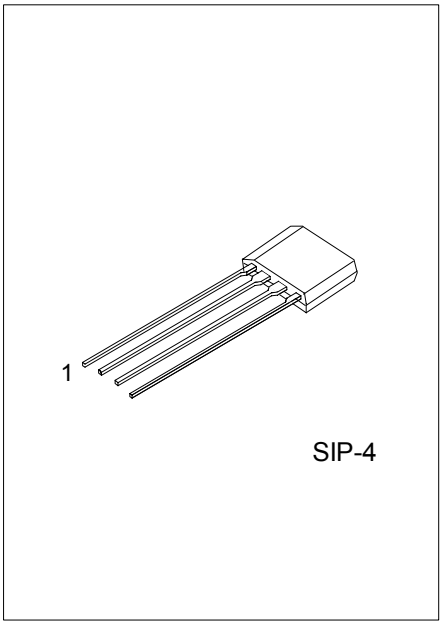
H654 **LINEAR INTEGRATED CIRCUIT**

COMPLEMENTARY OUTPUT HALL EFFECT LATCH



SIP-4

*Pb-free plating product number: H654L

■ DESCRIPTION

The UTC **H654** is integrated Hall sensors with complementary output drivers designed for electronic commutation of brushless DC Fan. It composed of an on-chip Hall voltage generator, a differential amplifier, Schmitt trigger, an open-collector output on a single chip. Furthermore, an internal bandgap regulator allows temperature compensated operations and a wide operating supply range. An on-chip protection diode is implemented to prevent reverse power fault.

When the magnetic flux density larger than threshold B_{OP}, DO will be turned on(low) and DOB be turned off(high). The output state is held until the magnetic flux density is lower than B_{RP}, and then DO is reversal to turned off and DOB turned on.

■ FEATURES

* Operate from 3.5V ~ 20V supply voltage.
* On-chip Hall sensor with two different sensitivity and hysteresis settings.
* High output sinking capability up to 300mA for driving large load.
* Lower current change rate reduces the peak output voltages during switching.
* Build-in protecting diode for chip reversal power connecting.(Note1)

■ ORDERING INFORMATION

Order Number		Package	Packing
Normal	Lead Free Plating		
H654-G04-K	H654L-G04-K	SIP-4	Bulk

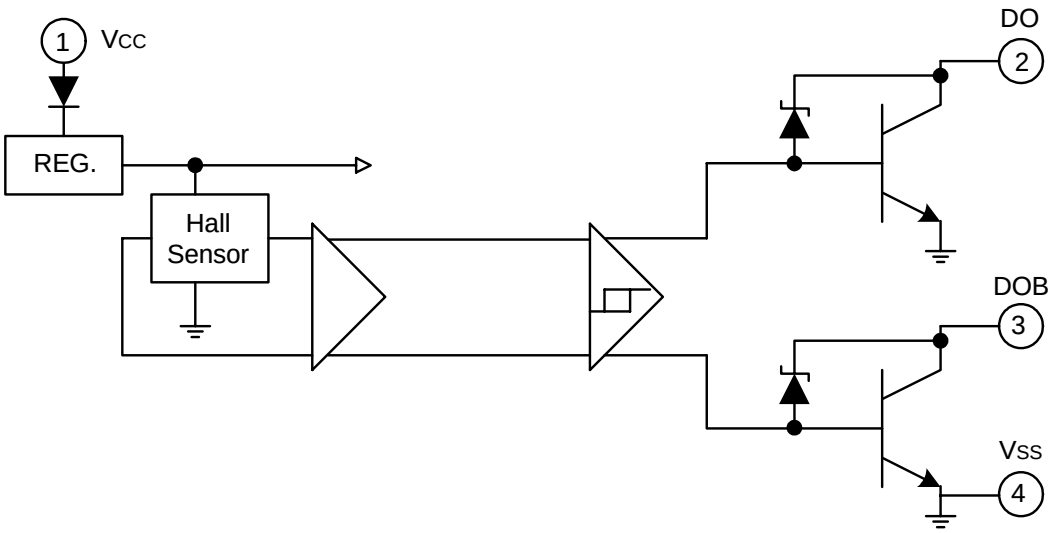
H654L-G04-K
(1)Packing Type
(2)Package Type
(3)Lead Plating

(1) B: Bulk
(2) G04: SIP-4
(3) L: Lead Free Plating, Blank: Pb/Sn

■ PIN DESCRIPTION

PIN NO.	PIN NAME	P/I/O	DESCRIPTION
1	V_{CC}	P	Positive Power Supply
2	DO	O	Output Pin
3	DOB	O	Output Pin
4	V_{SS}	P	Ground

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

PARAMETER		SYMBOL	RATINGS	UNIT
Supply Voltage		V_{CC}	20	V
Reverse V_{CC} Polarity Voltage		V_{RCC}	-35	V
Output OFF Voltage		V_{CE}	50	V
Magnetic flux density		B	Unlimited	
Output ON Current	Continuous	I_C	0.3	A
	Hold		0.4	
	Peak (Start Up)		0.7	
Power Dissipation		P_D	500	mW
Junction Temperature		T_J	+150	℃
Operating Temperature		T_{OPR}	-20 ~ +85	℃
Storage Temperature		T_{STG}	-65 ~ +150	℃

Note 1: Output Zener protection voltage

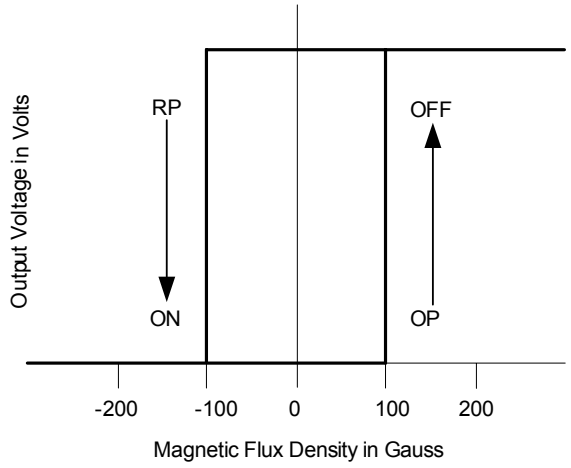
■ ELECTRICAL CHARACTERISTICS (Ta =25°C, unless otherwise specified.)

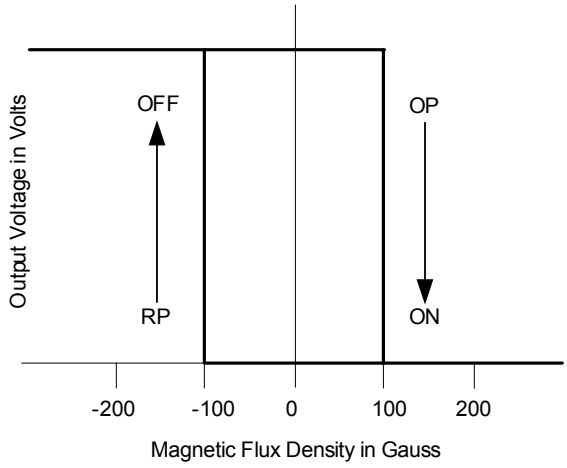
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Low Supply Voltage	V_{CE}	V_{CC}=3.5V, I_L=100mA		0.4		V
Supply Voltage	V_{CC}		3.5		20	V
Output Saturation Voltage	$V_{CE(SAT)}$	V_{CC}=14V, I_L=300mA		0.3	0.6	V
Output Leakage Current	I_{CEX}	V_{CE}=14V, V_{CC}=14V		<0.1	10	μA
Supply Current	I_{CC}	V_{CC}=20V, Output Open		16	25	mA
Output Rise Time	t_R	V_{CC}=14V, R_L=820Ω, C_L=20pF		3.0	10	μS
Output Falling Time	t_F	V_{CC}=14V, R_L=820Ω, C_L=20pF		0.3	1.5	μS
Switch Time Differential	Δt	V_{CC}=14V, R_L=820Ω, C_L=20pF		3.0	10	μS

■ MAGNETIC CHARACTERISTICS

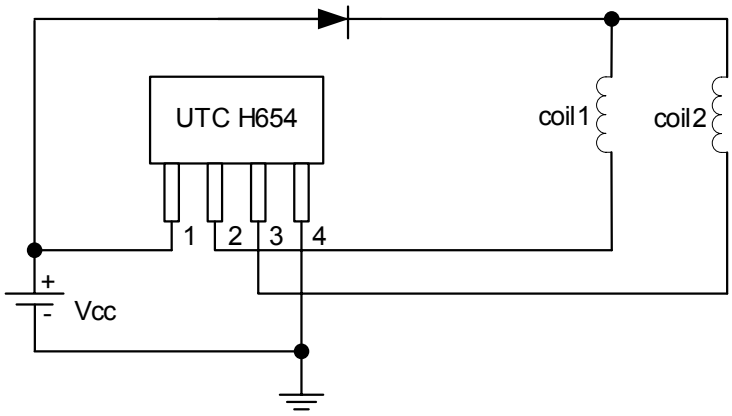
PARAMETR	SYMBOL	Ta= 25℃		Ta= 0 ~ +70℃		UNIT
		MIN	MAX	MIN	MAX	
Operate Point	B_{OP}		100		100	G
Release Point	B_{RP}	-100		-100		G
Hysteresis	B_{HYS}	50	200	30	200	G

■ HYSTERESIS CHARACTERISTICS



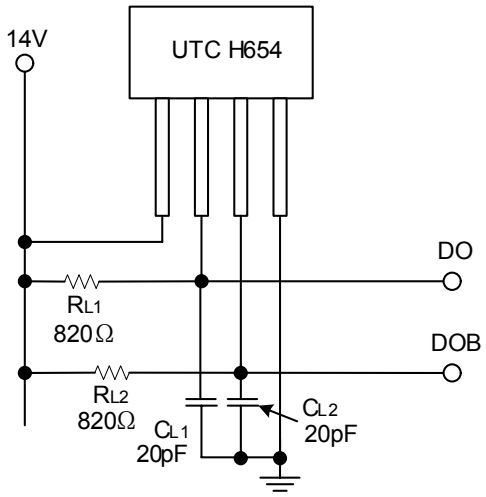


■ TYPICAL APPLICATION CIRCUIT



Brushless DC Fan

■ TEST CIRCUIT



■ PERFORMANCE CHARACTERISTICS

Ta(℃)	25	50	60	70	80	85	90	95	100	105	110	115	120
P_D (mW)	550	525	515	505	485	475	465	455	445	425	405	385	365