



## USS40

Preliminary

LINEAR INTEGRATED CIRCUIT

### BIPOLAR LATCH TYPE HALL EFFECT FOR HIGH-TEMPERATURE OPERATION

#### DESCRIPTION

The UTC **USS40** is a semiconductor integrated circuit utilizing the Hall effect. It designed to operate in the alternating magnetic field especially at low supply voltage and operation over extended temperature ranges to +125°C.

This Hall IC is suitable for application to various kinds of sensors, contact-less switches, such as Speed sensor, Position sensor, Rotation sensor, Contact-less sensor, and Motor control.

#### FEATURES

- \* Wide Temperature Operation Range of -40°C~+125°C
- \* Alternating Magnetic Field Operation
- \* Built-in Protection Diode
- \* Withstand Voltage 50V
- \* TTL and MOS IC are Directly Drivable by the Output
- \* The life is Semi Permanent because it Employs Contact-Less Parts

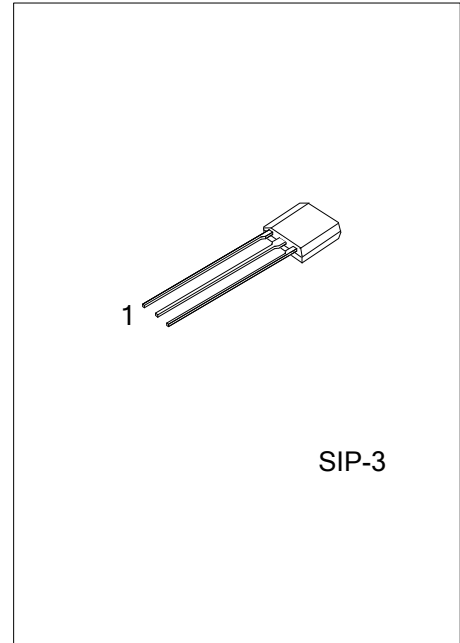
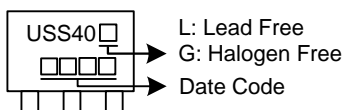
#### ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
USS40L-G03-B	USS40G-G03-B	SIP-3	I	G	O	Tape Box
USS40L-G03-K	USS40G-G03-K	SIP-3	I	G	O	Bulk

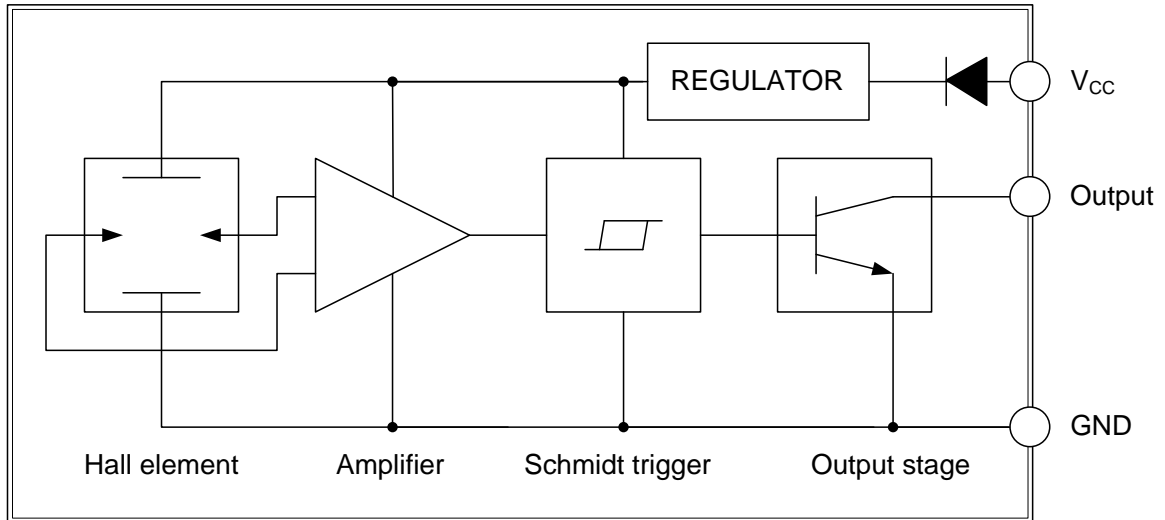
Note: Pin Assignment: I: V<sub>CC</sub> O: V<sub>OUT</sub> G: GND

USS40G-G03-B	(1)Packing Type	(1) B: Tape Box, K: Bulk
	(2)Package Type	(2) G03: SIP-3
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

#### MARKING



■ BLOCK DIAGRAM



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

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	24	V
Circuit Current	$I_O$	50	mA
Power Dissipation	$P_D$	500	mW
Operating Temperature	$T_{OPR}$	-40 ~ +125	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-40 ~ +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.

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage Range	$V_{DD}$	Operating	4.5		24	V
Output Leakage Current	$I_{LEAK}$	$V_{CC}=12\text{V}$ , $B < B_{RP}$		2.5	10	$\mu\text{A}$
Supply Current	$I_{CC}$	$V_{CC}=12\text{V}$		5	10	mA
Saturation Voltage	$V_{DS(ON)}$	$V_{CC}=12\text{V}$ , $B > B_{OP}$ , $I_{OUT}=20\text{mA}$		0.45	0.60	V
Output Switching Time	$T_R$	$V_{CC}=12\text{V}$ , $R_L=1.1\text{K}\Omega$ , $C_L=20\text{pF}$		0.2	1.5	$\mu\text{S}$
	$T_F$	$V_{CC}=12\text{V}$ , $R_L=1.1\text{K}\Omega$ , $C_L=20\text{pF}$		0.2	1	$\mu\text{S}$
<b>MAGNETIC CHARACTERISTICS</b>						
Operate Point	$B_{OP}$	At $T_A=25^\circ\text{C}$	5	35	70	G
Release Point	$B_{RP}$	At $T_A=25^\circ\text{C}$	-70	-35	-5	G
Hysteresis	$B_{HYS}$	At $T_A=25^\circ\text{C}$	10	70	130	G

Note:  $B_{OP}$ =operate point (output turns ON);  $B_{RP}$  =release point (output turns OFF);  $B_{HYS}$  =hysteresis( $B_{OP} - B_{RP}$ ).

As used here, negative flux densities are defined as less than zero (algebraic convention). Typical values are at  $T_A=25^\circ\text{C}$  and  $V_{CC}=12\text{V}$ .

■ PACKAGE INFORMATION

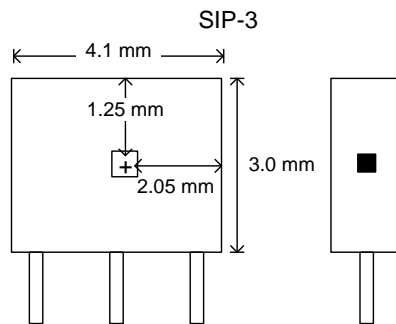


Fig. 1 SENSOR LOCATIONS

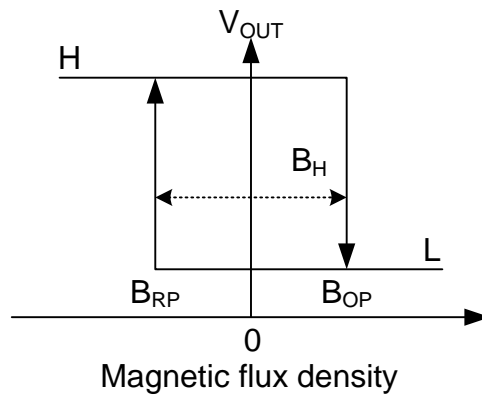
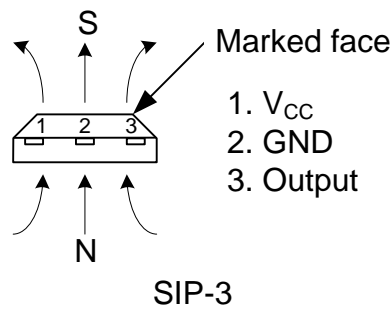
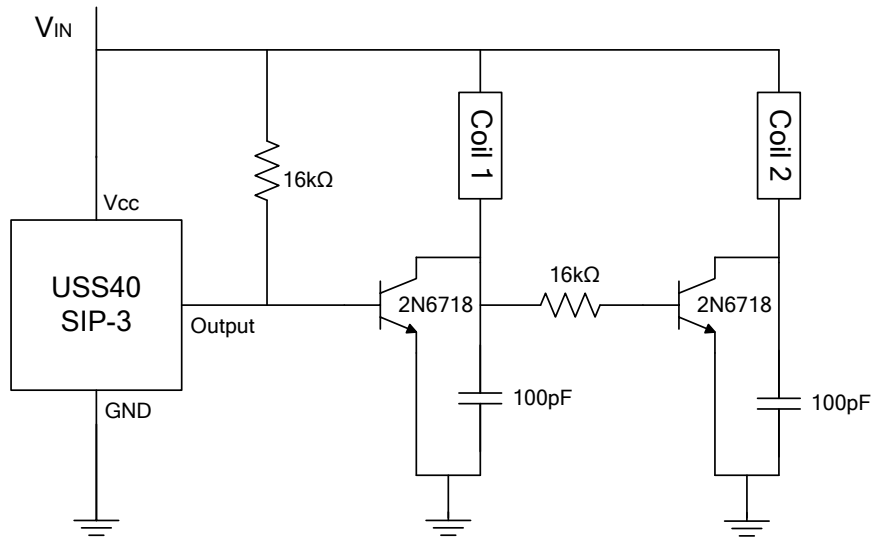
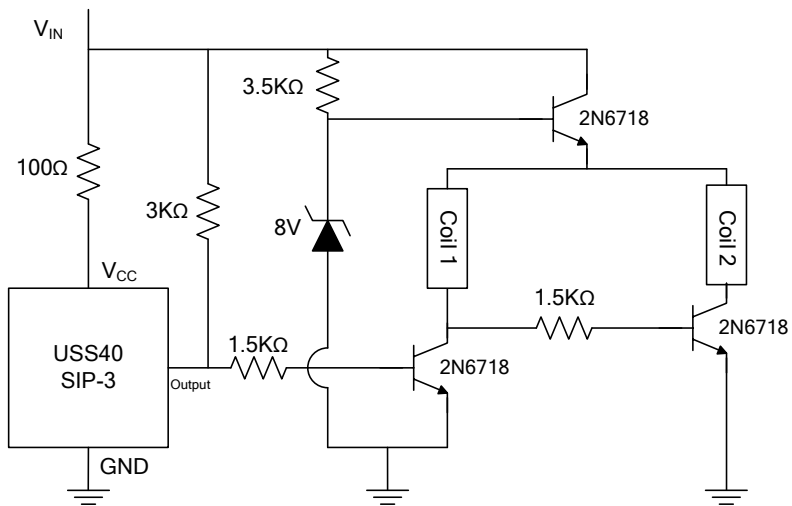


Fig. 2 APPLYING DIRECTION OF MAGNETIC FLUX

## ■ TYPICAL APPLICATION CIRCUIT

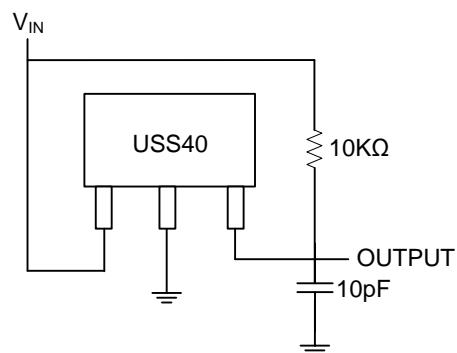


FOR DC FAN 1



FOR DC FAN 2

## ■ TEST CIRCUIT



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