

CS3140 SERIES HALL-EFFECT SWITCH ICs

CS3140 series Hall-effect switch integrated circuits for high temperature operating based on Hall-effect principle, apply the semiconductor monolithic technology, which includes a voltage regulator, Hall voltage generator, differential amplifier, Schmitt trigger and an open-collector output on a single silicon chip. ICs can convert the input magnetic field signal into digital voltage output.



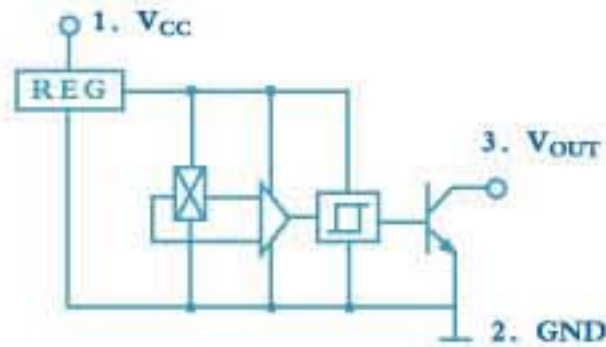
FEATURES

- ◆ Small Size
- ◆ High Sensitivity
- ◆ Quick Response
- ◆ Good Temperature Performance
- ◆ High Accuracy
- ◆ Excellent Reliability

TYPICAL APPLICATION

- ◆ Non-contact Switch
- ◆ Automotive Ignition
- ◆ Brake ICs
- ◆ Position Control, Revolution Detection
- ◆ Safe Alarm Device
- ◆ Textile Control System

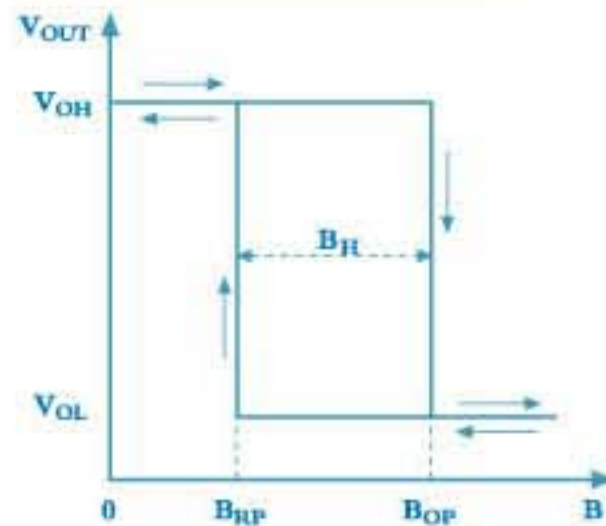
FUNCTIONAL BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Type	Value	Unit
Supply Voltage	V_{CC}		28	V
Quiescent Output Voltage	V_o		28	V
Output Current	I_o		25	mA
Operating Temperature Range	T_A	suffix "E"	-40~85	°C
		suffix "L"	-40~150	
Storage Temperature Range	T_S		-65~150	°C

MAGNETIC-ELECTRICAL TRANSFER CHARACTERISTICS



ELECTRICAL CHARACTERISTICS

Parameter	Test Condition	Symbol	Value			Unit
			Min.	Typ.	Max.	
Supply Voltage	$V_{CC}=4.5V\sim 24V$	V_{CC}	4.5	-	24	V
Output Low Voltage	$V_{CC}=4.5V, V_O=24V, I_O=20mA, B \geq B_{OP}$	V_{OL}	-	175	400	mV
Output Leakage Current	$V_O=24V, B < B_{RP}$	I_{OH}	-	<1.0	10	μA
Supply Current	$V_{CC}=24V, V_O$ open-collector output	I_{CC}	-	3.0	9.0	mA
Output Rise Time	$V_{CC}=12V, R_L=820\Omega, C_L=20pF$	t_r	-	0.2	2.0	μS
Output Fall Time		t_f	-	0.18	2.0	μS

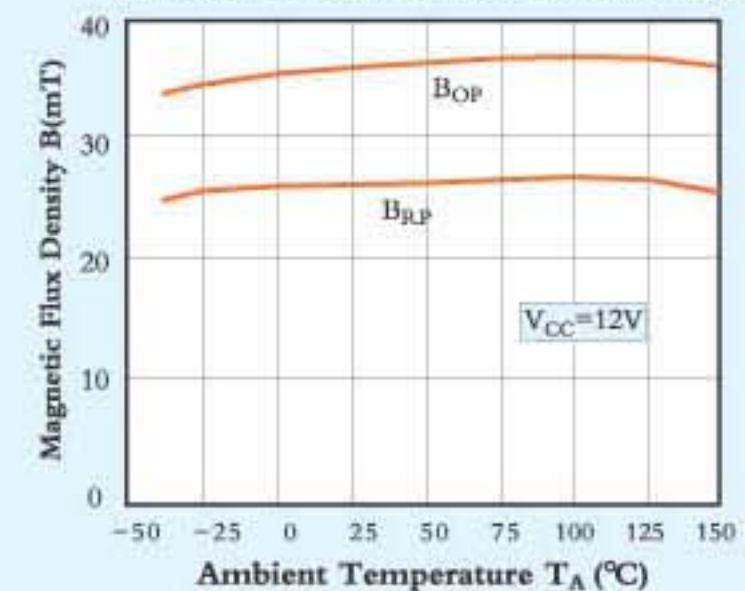
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MAGNETIC CHARACTERISTICS (Unit :mm)

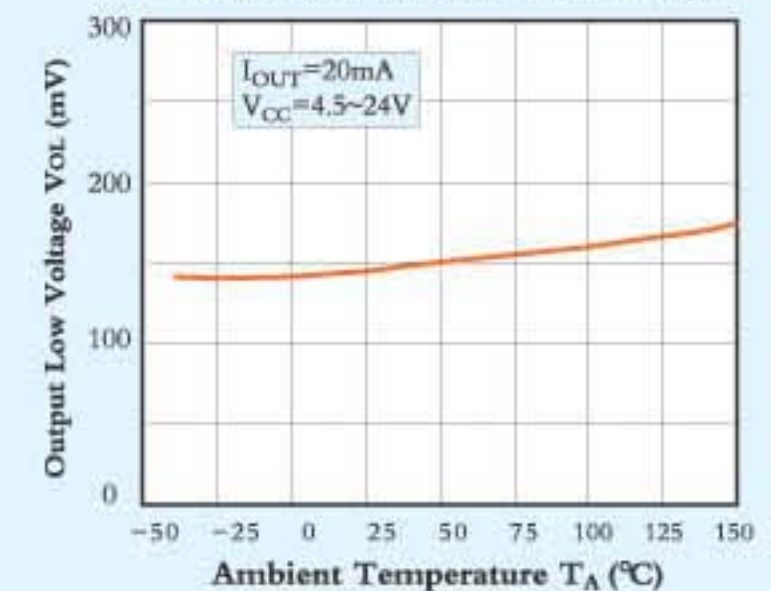
Parameter		Type											
		CS3141(E, L)			CS3142(E, L)			CS3143(E, L)			CS3144(E, L)		
		Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.
Operate Point (B_{OP})	$T_A=25^\circ C$	5.0	10.0	16.0	13.0	18.0	23.0	22.0	28.0	34.0	7.0	-	35.0
	Full Operating Temperature Range	3.0	10.0	17.5	11.5	18.0	24.5	20.5	28.0	35.5	3.5	-	45.0
Release Point (B_{RP})	$T_A=25^\circ C$	1.0	4.5	13.0	7.5	12.5	17.5	16.5	22.5	28.5	5.0	-	33.0
	Full Operating Temperature Range	1.0	4.5	14.5	6.0	12.5	19.0	15.0	22.5	30.0	2.5	-	43.0
Hysteresis (B_H)	$T_A=25^\circ C$	2.0	5.5	8.0	3.0	5.5	8.0	3.0	5.5	8.0	2.0	5.5	-
	Full Operating Temperature Range	2.0	5.5	8.0	3.0	5.5	8.0	3.0	5.5	8.0	2.0	5.5	-

CHARACTERISTICS CURVES

Temperature Characteristics of B_{OP}, B_{RP}



Temperature Characteristics of V_{OL}



PACKAGE OUTLINE DRAWING (Unit :mm)

Please Referring to Page7 ①. ②. ③

- ◆ TO-92UA Package and position of sensitive point
- ◆ TO-92T Package and position of sensitive point
- ◆ TO-92U Package and position of sensitive point

CAUTIONS:

- ◆ It is possible that outside mechanical stress affects the operating point and the release point of Hall-effect circuits, therefore, mechanical stress should be lessened as far as possible in the process of assembly;
- ◆ Pay attention to the soldering temperature at the leads, keep it lower in a short time to guarantee good soldering quality.

PIN NOTES:

- (TO-92UA, TO-92T, TO-92U package)
1. Power Supply
 2. Ground
 3. Output

