

Application Note

AH280 Demo Board Smart Hall-Effect Fan Driver

Contents

1. Features
2. General Description
3. Block Diagram
4. Pin Configuration
5. Absolute Maximum Ratings
6. Typical Performance Characteristics
7. Application Information
8. Manufacturers and Distributor Contact Information
9. Demo Board Schematic

Application Note

AH280 Demo Board Smart Hall-Effect Fan Driver

1.0 Features

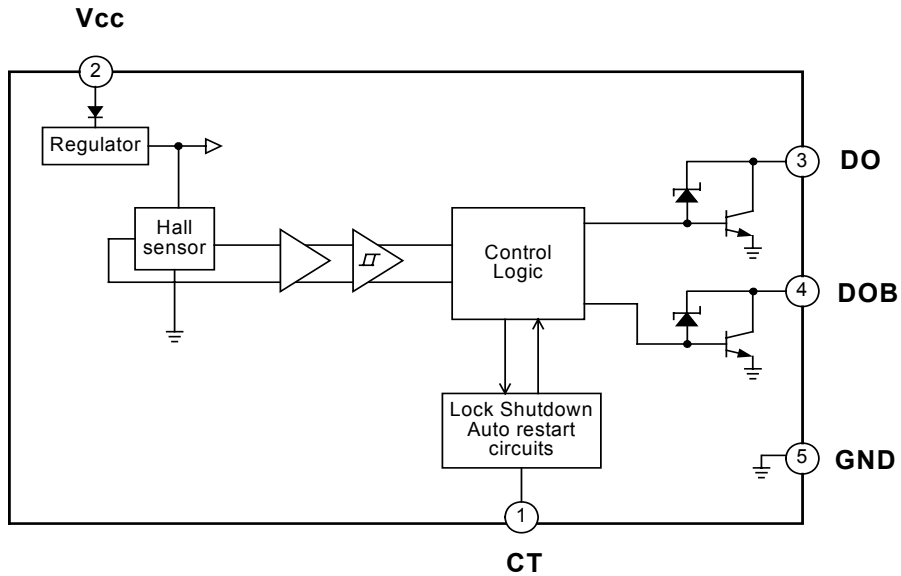
- On Chip Hall Plate
- Built-in Zener Protection for Output Driver
- Built-in Protection Diode for Power Reverse Connecting
- Rotor-Locked Detection
- Automatically Restart after Release of Motor Locking
- Adjustable Auto Restart Time
- Operating Voltage: 3.5~20 V
- Output Current: $I_{O(AVE)} = 500_{mA}$
- Package: SIP-5L
- Less External Components

2.0 General Description

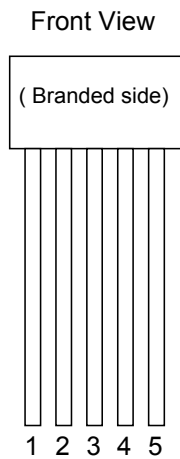
AH280 is the integrated Hall sensor owning two complementary outputs for the motor's coil driving, auto locked shutdown and auto restart functions. The functional block diagram includes a regulator with temperature-compensated band-gap, an on-chip Hall voltage generator, a comparator, a Schmitt trigger and two current output drivers. The regulator can provide a wide operational voltage range. The Hall voltage generator is to amplify the Hall voltage due to the Hall effect. A Schmitt trigger is to provide switching hysteresis for noise rejection. To avoid coil burning, the rotor-lock detection circuit will shutdown the output driver if it detects rotor-lock status. A rotation recovery circuit is to restart the motor after the rotor-lock is removed. In addition, the auto re-start time is flexible by adjusting the capacitance (C_T).

Application Note
AH280 Demo Board Smart Hall-Effect Fan Driver

3.0 Block Diagram



4.0 Pin Configuration



Symbol	P/I/O	Pin #	Description
CT	I	1	Timing Cap
Vcc	P	2	Positive Power Supply
DO	O	3	Driver Output
DOB	O	4	Driver Inverted Output
GND	P	5	Ground

Application Note

AH280 Demo Board Smart Hall-Effect Fan Driver

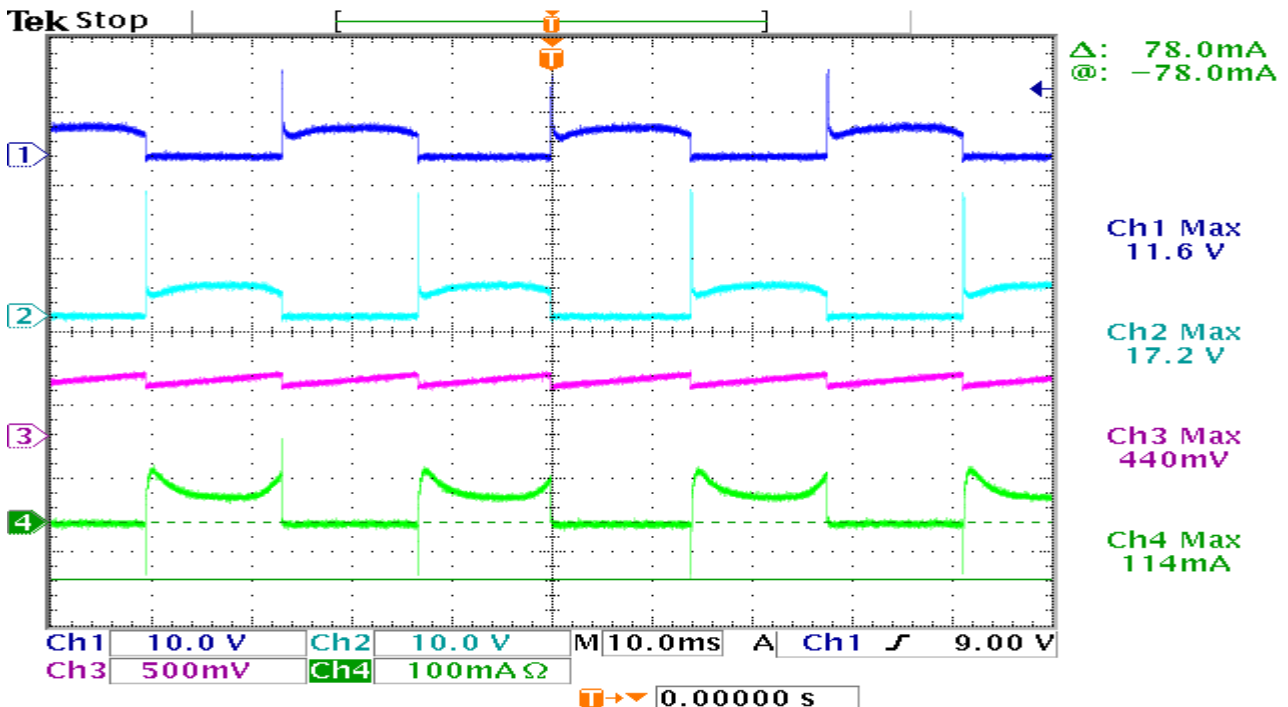
5.0 Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Internal Zener-Protected Voltage	VCB	36	V
Operating Supply Voltage	V _{CC OPR}	20	V
Output Current	I _{O (AVE)}	500	mA
	I _{O (PEAK)}	800	
Power Dissipation	P _D	700	mW
Operating Temperature	T _{OPR}	-20~85	°C
Storage Temperature	T _{STG}	-55~150	°C

6.0 Typical Performance Characteristics

1. Min. Start-up (V = 3.5V, I_{cc} = 0.06A)

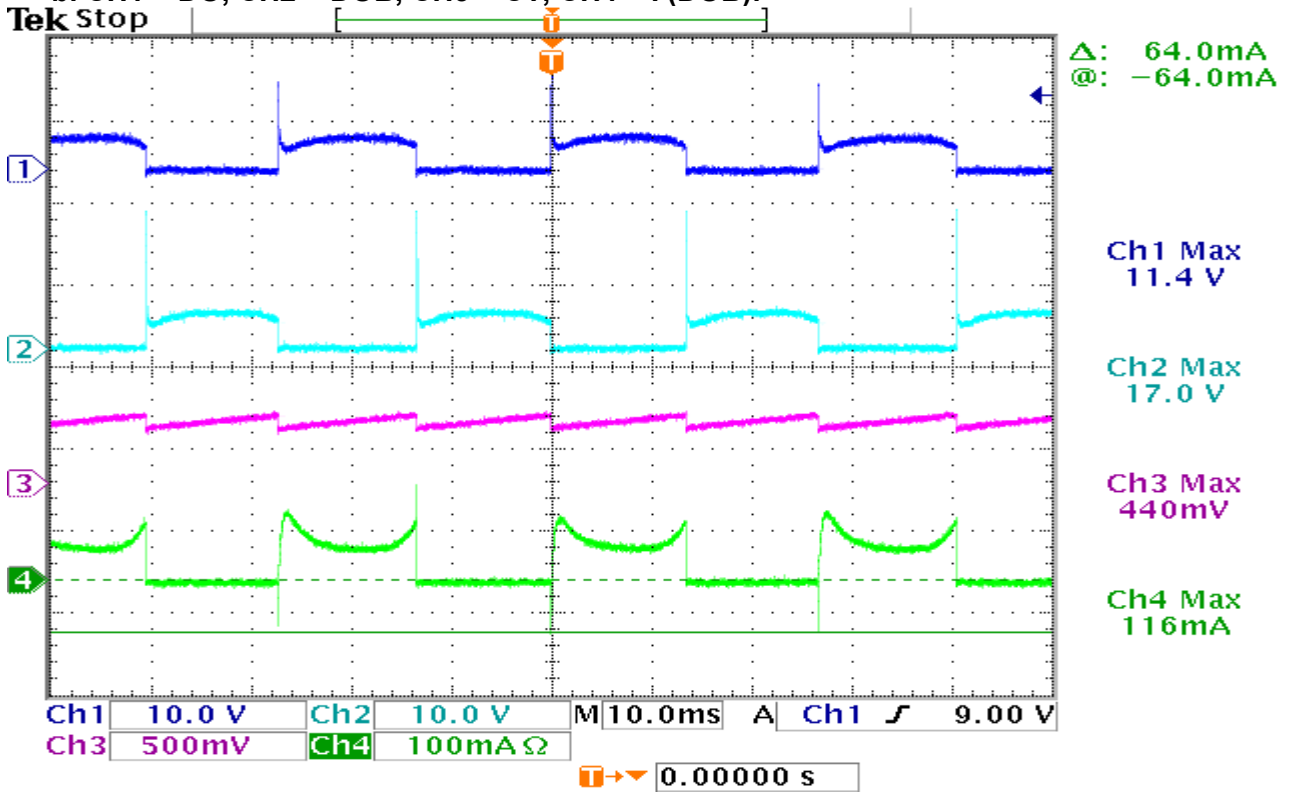
a. CH1 = DO, CH2 = DOB, CH3 = CT, CH4 = I (DO):



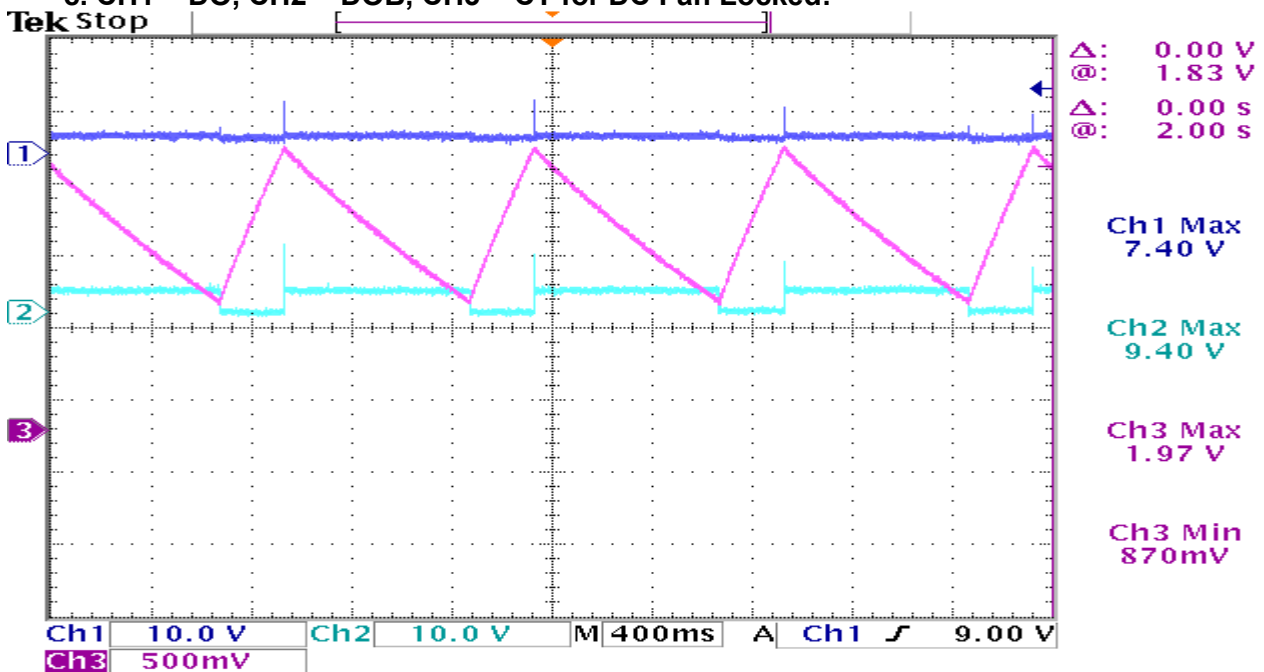
Application Note

AH280 Demo Board Smart Hall-Effect Fan Driver

b. CH1 = DO, CH2 = DOB, CH3 = CT, CH4 = I (DOB):



c. CH1 = DO, CH2 = DOB, CH3 = CT for DC Fan Locked:

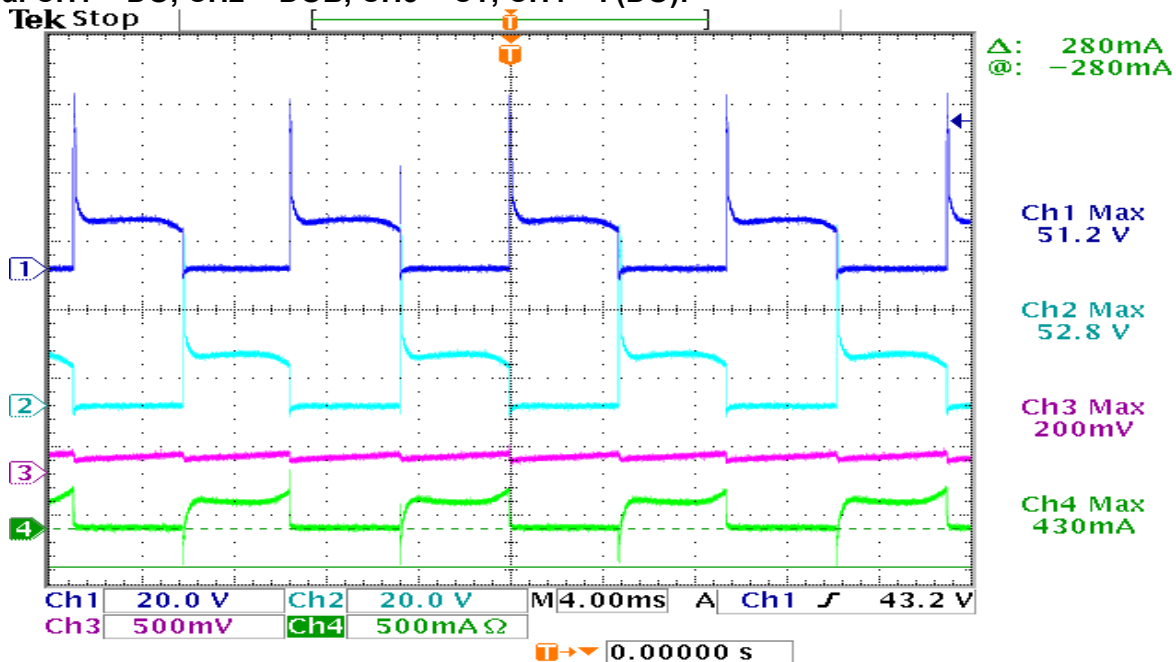


Application Note

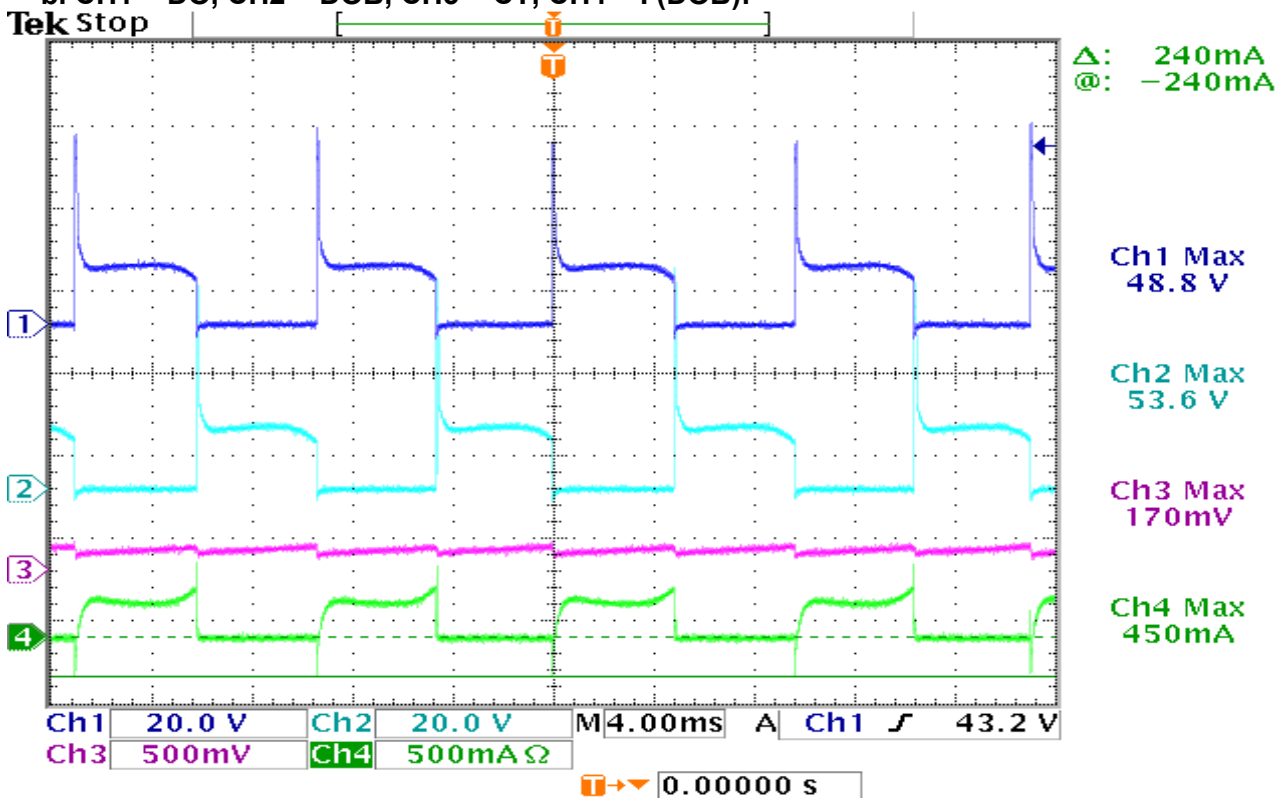
AH280 Demo Board Smart Hall-Effect Fan Driver

6.0.2. Operation (V = 12V, I_{cc} = 0.18A)

a. CH1 = DO, CH2 = DOB, CH3 = CT, CH4 = I (DO):



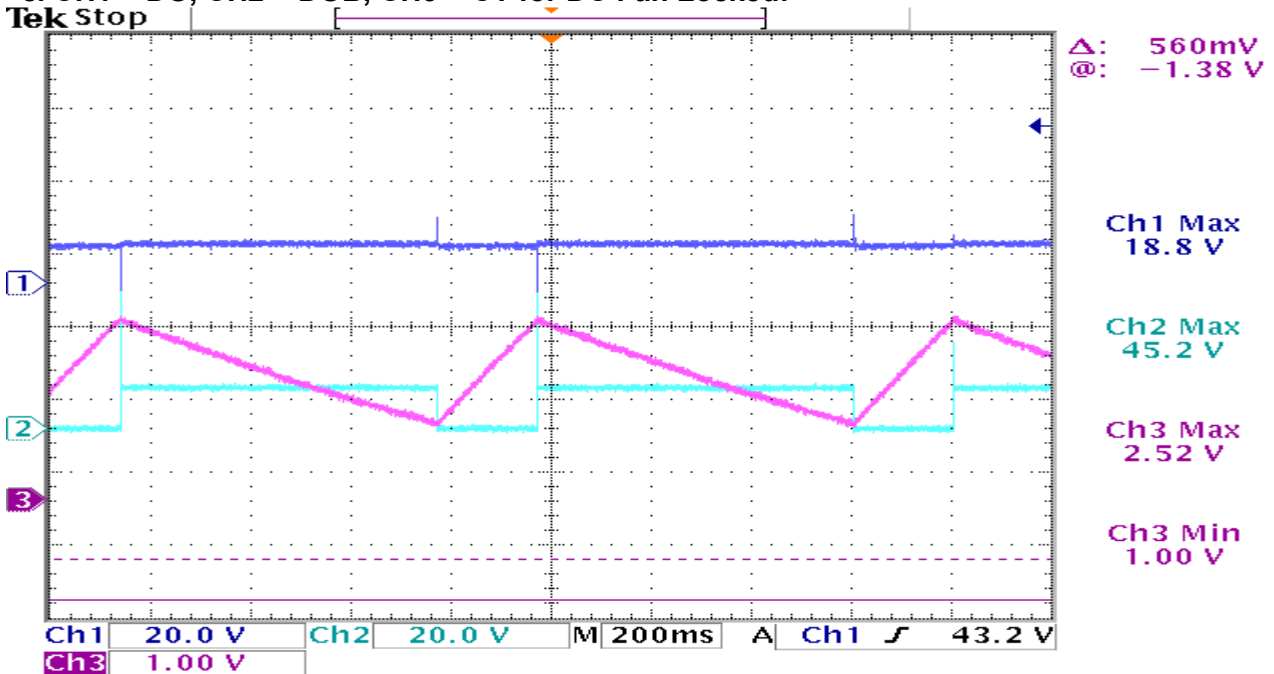
b. CH1 = DO, CH2 = DOB, CH3 = CT, CH4 = I (DOB):



Application Note

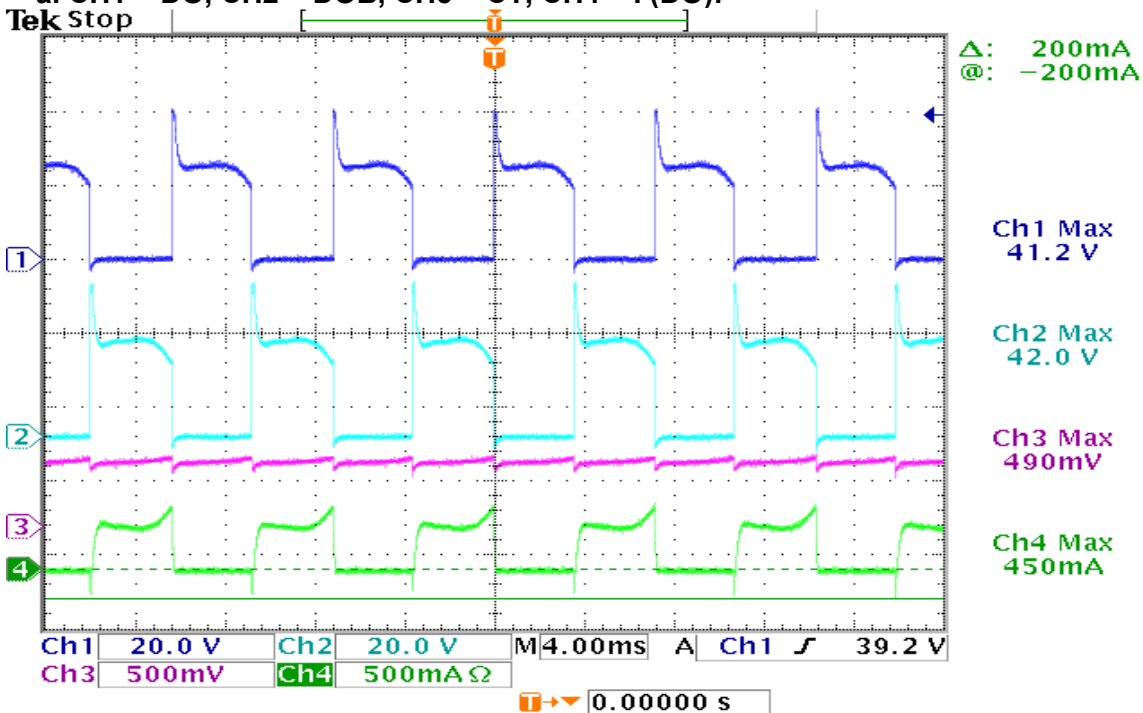
AH280 Demo Board Smart Hall-Effect Fan Driver

c. CH1 = DO, CH2 = DOB, CH3 = CT for DC Fan Locked:



6.0.3. Max Working (V = 20V, I_{cc} = 0.29A)

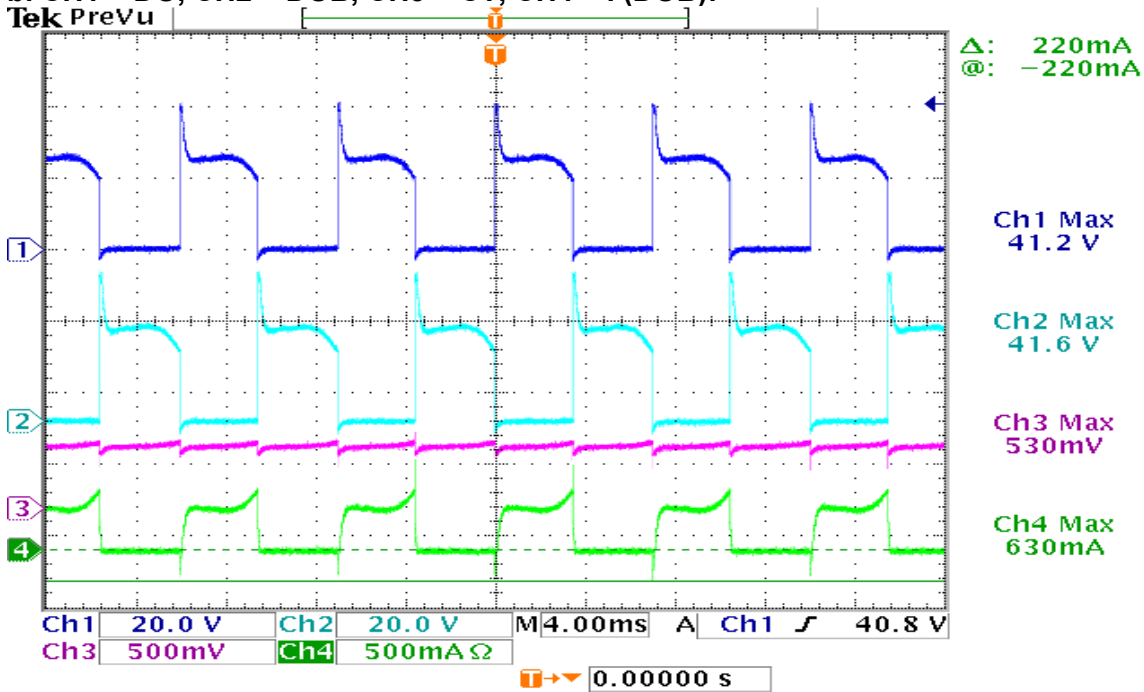
a. CH1 = DO, CH2 = DOB, CH3 = CT, CH4 = I (DO):



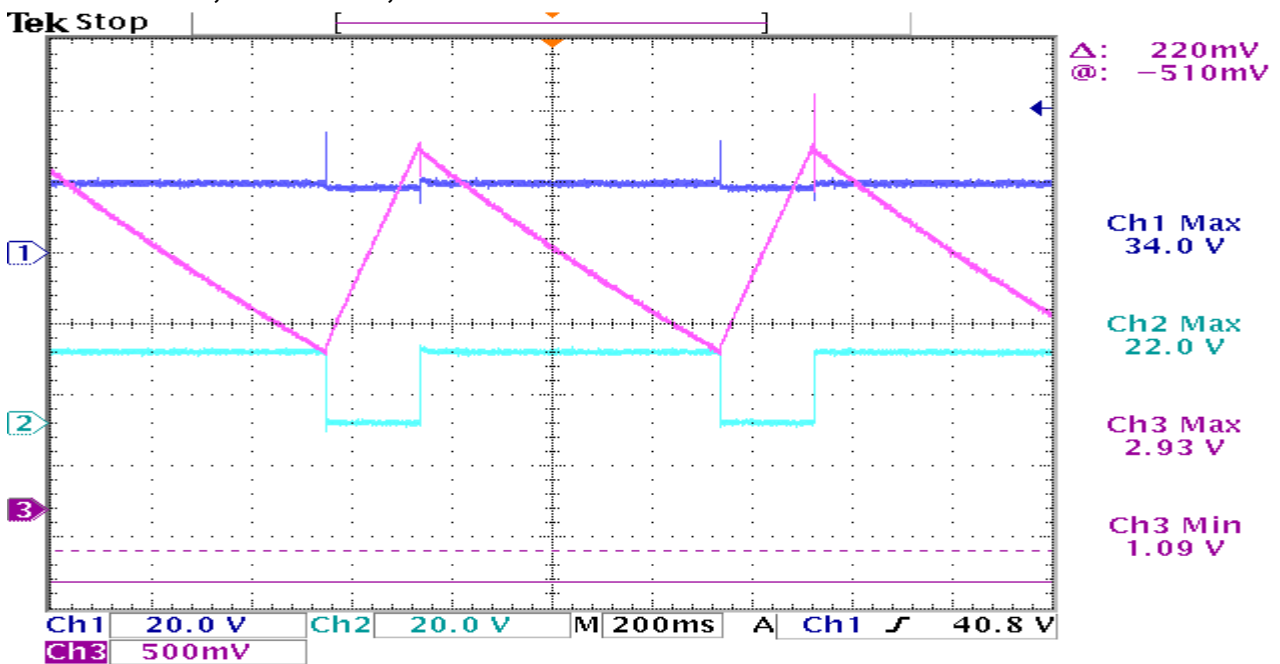
Application Note

AH280 Demo Board Smart Hall-Effect Fan Driver

b. CH1 = DO, CH2 = DOB, CH3 = CT, CH4 = I (DOB):



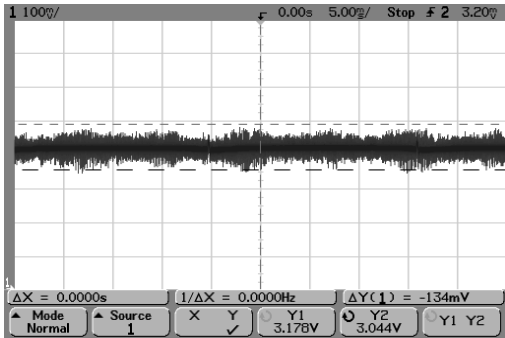
c. CH1 = DO, CH2 = DOB, CH3 = CT for DC Fan Locked :



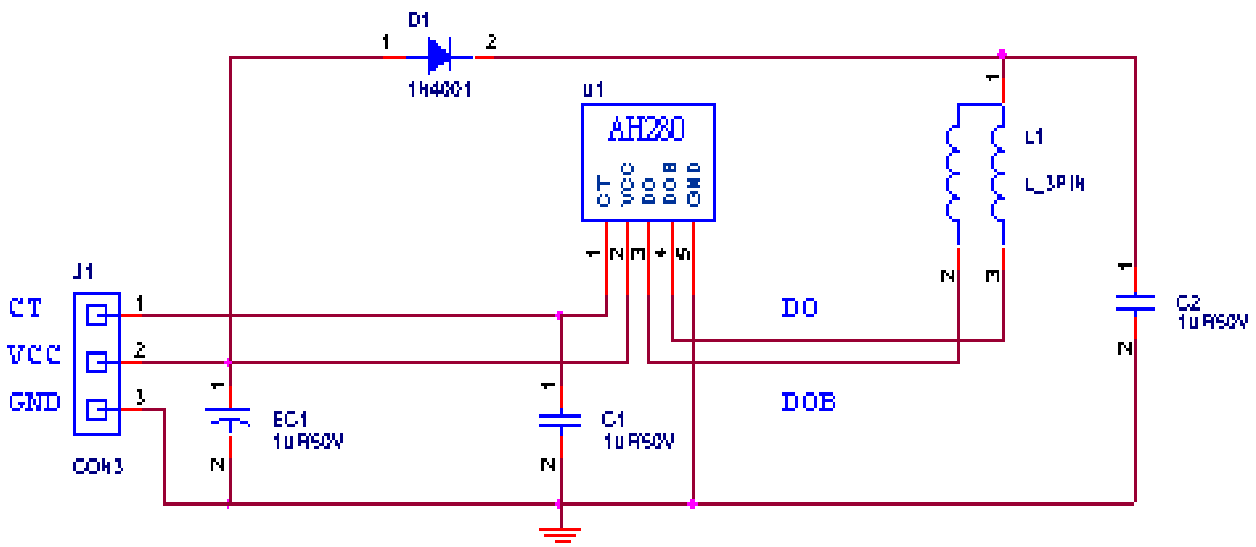
Application Note

AH280 Demo Board Smart Hall-Effect Fan Driver

6.0.4. V_{rpp} Volt.



7.0 Application Information



Application Note

AH280 Demo Board Smart Hall-Effect Fan Driver

7.0.1 Parts List (Board of Materials):

L1 mH/Z (Ω)	Coil 1	Coil 2	Coil 1+ Coil 2
100HZ	9.28mH/36.05 Ω	9.32mH /36.74 Ω	37.26mH/75.88 Ω

Item	Part Number	MFG/Dist.	Description	Value	Quantity
EC1	Std		Aluminum Electrolytic	1uf/50V	1
C1	Std		Ceramic Capacitor	1uf/50V	1
C2	Std		Ceramic Capacitor	1uf/50V	1
D1	1N4001		SMD/Diode	50V, 2A	1
L1	BOARD-TECH		DIP/coil1, 2, com	50V, 2A	1
U1	AH280	Anachip	Hall I _c DIP	20V, 0.5A	1

8.0 Manufacturers and Distributor Contact Information

Anachip Corp. 易亨電子股份有限公司	Phone	+886-2-2655-1818
	Fax	+886-2-2655-1616
	Website	http://www.anachip.com.tw http://www.anachip.com
HAWYANG Electronics Co., LTD 浩陽科技有限公司	Phone	+886-2-2219-0903
	Fax	+886-2-2219-3189
	Website	http://www.hawyang.com.tw
JAENN Electronics Co., LTD 振遠科技有限公司	Phone	+886-2-8912-1688
	Fax	+886-2-8912-1699
	Website	http://www.jaenn.com.tw

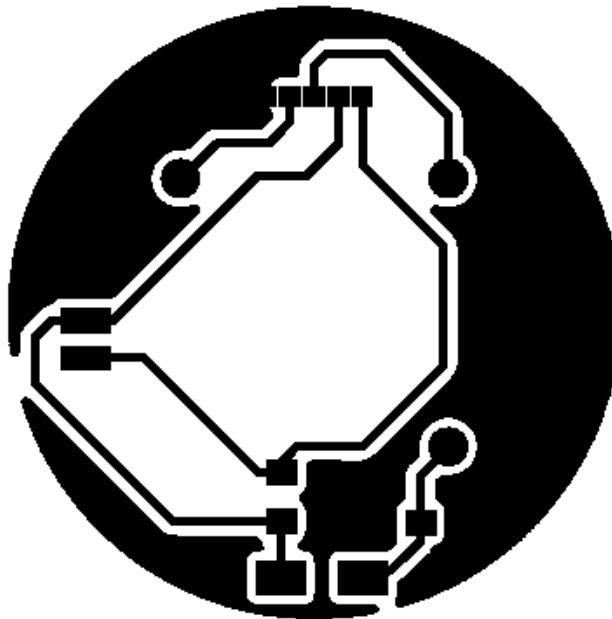
Application Note

AH280 Demo Board Smart Hall-Effect Fan Driver

9.0 Demo Board Schematic:

Typical PC Board Layout, Adjustable Output: (1x Size)

(1). Component Side PC Board Layout



Application Note
AH280 Demo Board Smart Hall-Effect Fan Driver

(2). Solder Side PC Board Layout

