

## A5984GES Evaluation Board User Guide

### DESCRIPTION

This evaluation board is used to demonstrate the Allegro A5984GES microstepping stepper motor driver IC.

### FEATURES

- Onboard oscillator to drive the Step input
- Switch bank to control all inputs besides the Step input

### EVALUATION BOARD CONTENTS

- APEK5984GES-01-T evaluation board

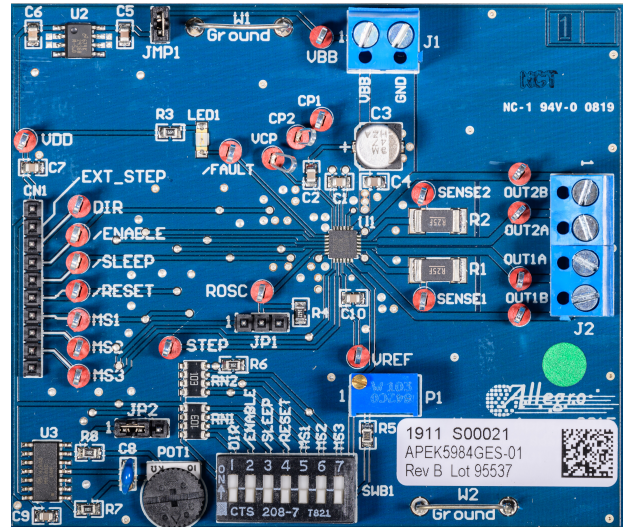


Figure 1: A5984GES Evaluation Board

### Table of Contents

Description .....	1
Features .....	1
Evaluation Board Contents .....	1
Using the Evaluation Board .....	2
Schematic .....	3
Layout .....	4
Bill of Materials .....	5
Related Links .....	6
Application Support .....	6
Revision History .....	7

Table 2: General Specifications

Specification	Min.	Nom.	Max.	Units
Motor Supply Voltage ( $V_{BB}$ ) Operating	8	–	30	V
VREF Output Voltage ( $V_{BB} = 6$ to $40$ V)	0	–	4	V
Input Logic Low Level	0	–	0.8	V
Input Logic High Level	2	–	5.5	V

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## USING THE EVALUATION BOARD

### EQUIPMENT REQUIRED

- Two-phase stepper motor
- Voltage supply to power the stepper motor

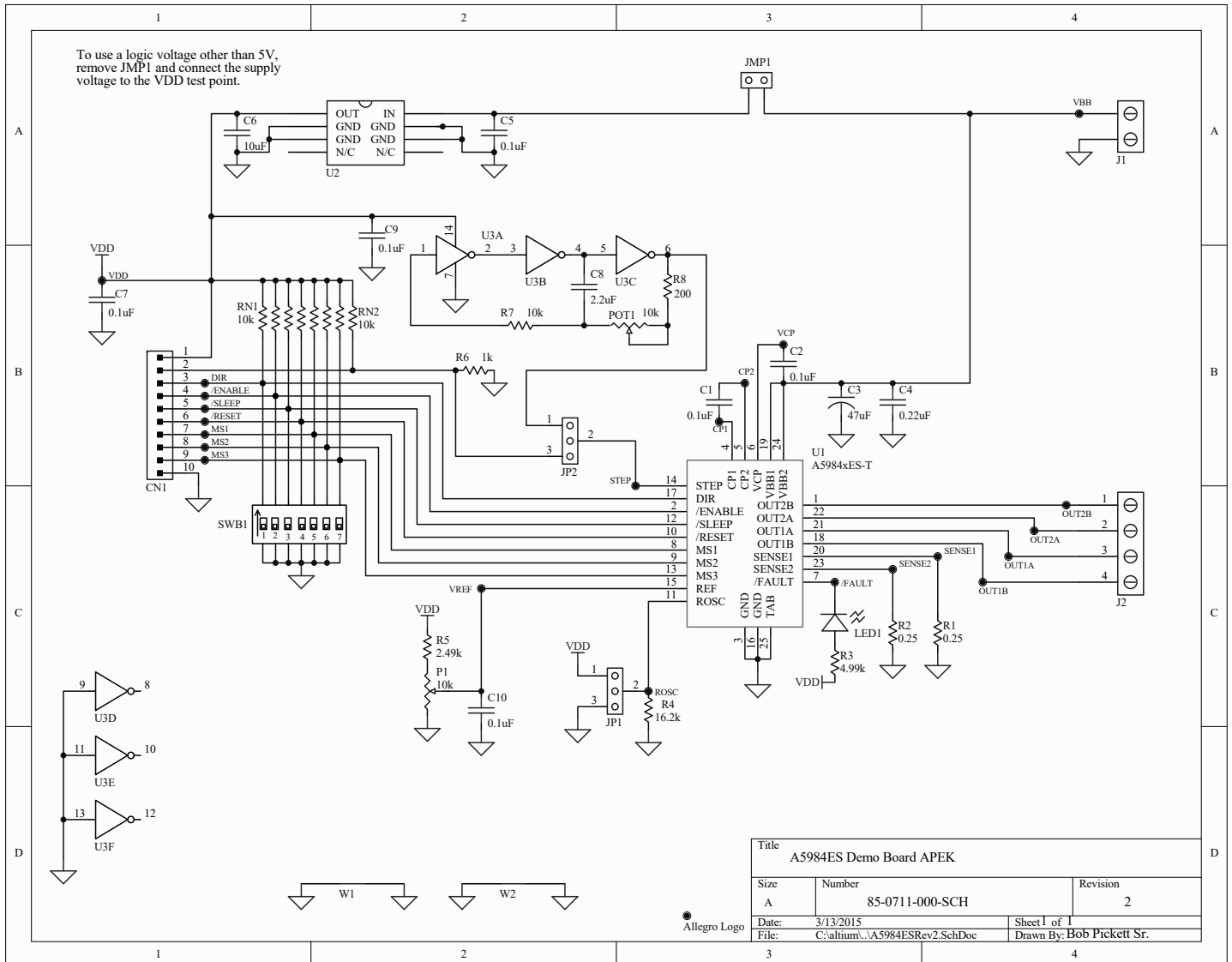
### SETUP

1. Set the motor voltage supply to the intended voltage.
2. Turn off motor voltage supply.
3. Connect motor voltage supply to J1.
4. Connect the stepper motor to J2. One winding connects to J2 pins 1 and 2. The second winding connects to J2 pins 3 and 4.

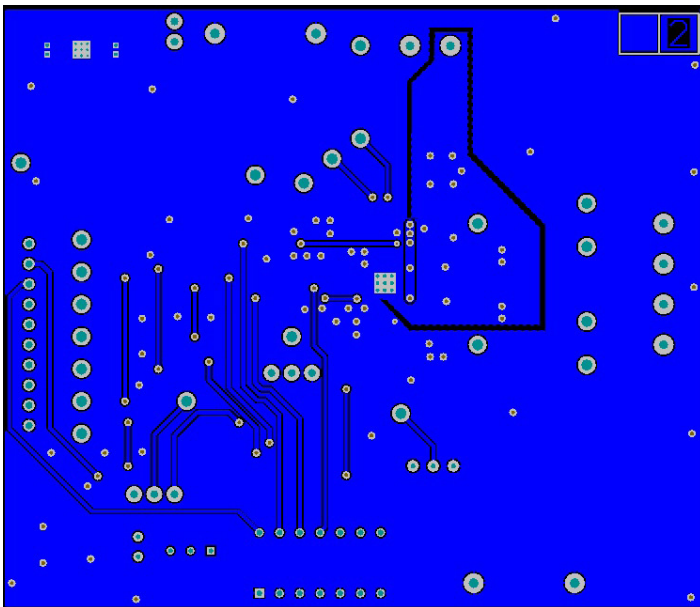
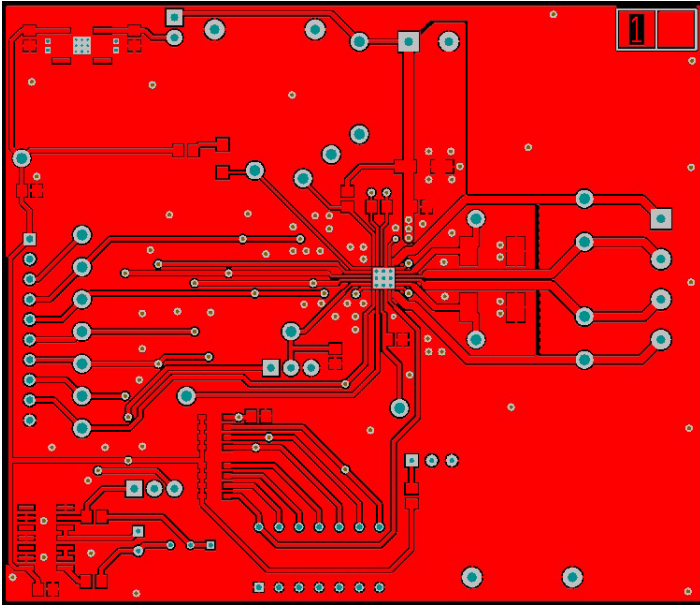
**Note: Do not connect or disconnect the motor unless the outputs are either disabled or the VBB voltage is off.**

5. Turn the voltage supply on.
6. If the stepper motor is not spinning, check the following:
  - A. Ensure that POT1 is adjusted to provide an appropriate Step input frequency for the stepper motor;
  - B. Ensure that the logic inputs are in the proper states;
  - C. Ensure that JMPI shunt is installed;
  - D. Ensure that P1 is adjusted to provide a VREF voltage that results in the proper peak output current.

# SCHEMATIC



# LAYOUT



# BILL OF MATERIALS

**Table 3: APEK5984GES-01-T Evaluation Board Bill of Materials**

ELECTRICAL COMPONENTS					
Designator	Quantity	Value	Description	Manufacturer Number	PCB Footprint
ENABLE, FAULT, RESET, SLEEP, CP1, CP2, DIR, MS1, MS2, MS3, OUT1A, OUT1B, OUT2A, OUT2B, ROSC, SENSE1, SENSE2, STEP, VBB, VCP, VDD, VREF	22		Large Test Point	Keystone Electronics 5010; Digikey 5010K-ND	PAD 57 125 TP HB
C1, C2, C7, C9, C10	5	0.1 µF	25 V Capacitor	TDK C2012X7R1E104K; Digikey 445-1351-1-ND	0805
C3	1	47 µF	50 V Capacitor	Chemi-Con EMZA500ADA470MF80G; Digikey565-2568-1-ND	UCC F61 Cap
C4	1	0.22 µF	50 V Capacitor	Murata GCM21BR71H224KA37L; Digikey 490-4970-1-ND	0805
C5	1	0.1 µF	50 V Capacitor	TDK C2012X7R1H104K085AA; Digikey 445-7534-1-ND	0805
C6	1	10 µF	25 V Capacitor	Murata GRM21BR61E106KA73L; Digikey 490-5523-1-ND	0805
C8	1	2.2 µF	16 V Capacitor	TDK FK18X5R1C225K; Digikey 445-8407-ND	0.1" Cap
CN1, JMP1, JP1, JP2	18 pins	–	Cut pins from 50-pin strip	Samtec TSW-150-07-T-S; Digikey SAM1035-50-ND	2-pos. shunt, 3-pos. shunt, 10pinUSBConn
–	4	–	Bumpon Foot	3M SJ-5303 (CLEAR); Digikey SJ5303-7-ND	Bumpon Foot
J1	1	–	2-Pin Screw Down Connector	On Shore Technology ED120/2DS; Digikey ED1609-ND	2-pin screw down connector
J2	1	–	4-Pin Screw Down Terminal Block	On Shore ED120/4DS; Digikey ED2227-ND	4-pin screw down connector
LED1	1	–	Red Surface-mount LED	Lite-On LTST-C150CKT; Digikey 160-1167-1-ND	1206 LED
P1	1	10 kΩ	1/2 W Potentiometer	Bourns 3299W-103LF; Digikey 3299W 103LF-ND	Through-hole Trimptot
–	–	–	PCB	85-0711-001 Rev. 2	–
POT1	1	10 kΩ	One Turn Thumbwheel Potentiometer	Bourns 3352T-1-103LF; Digikey 3352T-103LF-ND	Thumbwheel Potentiometer
QC8	2 pins	–	Sockets for through-hole components. Cut from 64-pin strip.	Mill-Max 310-43-164-41-001000; Digikey ED6264-ND	–
R1, R2	2	0.25 Ω	1 W Resistor	Vishay/Dale WSL2512R2500FEA; Digikey WSLG-.25CT-ND	2512
R3	1	4.99 kΩ	1/8 W Resistor	Panasonic ERJ-6ENF4991V; Digikey P4.99KCCT-ND	0805
R4	1	16.2 kΩ	1/8 W Resistor	Stackpole RMCF0805FT16K2; Digikey RMCF0805FT16K2CT-ND	0805
R5	1	2.49 kΩ	1/8 W Resistor	Rohm MCR10EZPF2491; Digikey RHM2.49KCRCT-ND	0805
R6	1	1 kΩ	1/8 W Resistor	Panasonic ERJ-6GEYJ102V; Digikey P1.0KACT-ND	0805
R7	1	10 kΩ	1/8 W Resistor	Panasonic ERJ-6GEYJ103V; Digikey P10KACT-ND	0805
R8	1	200 Ω	1/8 W Resistor	Panasonic ERJ-6GEYJ201V; Digikey P200ACT-ND	0805
RN1, RN2	2	10 kΩ	4 Resistor Array (isolated)	CTS 744C083103JP; Digikey 744C083103JPCT-ND	CTS 744 Series
SWB1	1	–	7-Position Through-hole Switch	CTS 208-7; Digikey CT2087-ND	CTS 208-7 Switch
U1	1	–	Microstepping Driver with Translator	A5984xES-T	ES_24-Pin_4x4QFN
U2	1	5 V	Linear Voltage Regulator	National LM2936HVMA-5.0/NOPB; Digikey LM2936HVMA-5.0/NOPB-ND	LM2936HVMA
U3	1	–	Hex Inverter	Fairchild MM74HC04MX; Digikey MM74HC04MXCT-ND	14-Pin SO (150 mil)
W1, W2	2	–	22 Gauge Buss Wire (300 mils above PCB)	–	Scope Ground
–	4	–	Shunts for JMP1, JMP2, JP1 and JP2	3M 969102-0000-DA; Digikey 3M9580-ND	–

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## RELATED LINKS

A5984 Product Page: <https://www.allegromicro.com/en/products/motor-drivers/brush-dc-motor-drivers/a5984>

## APPLICATION SUPPORT

For applications support contact, go to <https://www.allegromicro.com/en/about-allegro/contact-us/technical-assistance> and navigate to the appropriate region.

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## Revision History

Number	Date	Description
-	September 22, 2023	Initial release

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