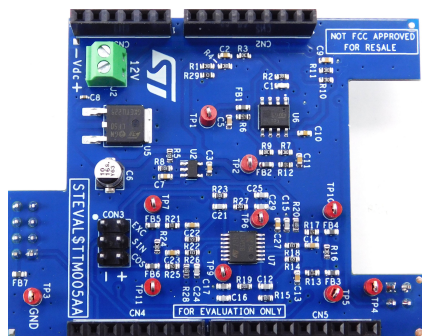# Resolver board reading for motor position estimation

Features

- Compatible with automotive control board STEVAL-TTM004V1 and STEVAL-TTM002V1
- Supported by the SPC5STUDIO MC tool
- 12V input voltage for a wide sinusoidal excitation signal
- Arduino connector for a full compatibility with the STM32G474RE
- Different outputs for a better noisy immunity (Sine and cosine signals generated by the resolver on motor)
- Suitable to manage field oriented control (FOC) algorithms

Description

The STEVAL-TTM005A is a powerful tool that has been specifically designed for developing and testing automotive motor control applications.

The board ensures accurate motion sensing based on rotor position estimation with resolver feedback.

This rotor position estimation allows to obtain an excellent control since zero speed, with the most advanced F.O.C. algorithms reducing any torque and speed ripple on the motor.

The board is supplied by a 12 V dc input and 5 V and includes ST's latest high-precision, low-noise operational amplifiers and an optimized excitation circuit that guarantees a reliable and accurate operation.

The excitation signal, generated by an external compatible control board (STEVAL-TTM004V1, STEVAL-TTM002V1, or the STM32G474RE connected with the Arduino connectors) is amplified by the TSB582 able to excite the resolver coil.

The two phase shifted resolver outputs, for sine and cosine waves, are treated by a TSB514 op amp and then converted into digital signals by the microcontroller on the control board.

With its high accuracy and extended compatibility, the board is an essential tool for validating and testing any high precision system for motion control sensing with high performance thanks to the rotary resolver and a best-in-class signal conditioning circuitry.

Product summary	
Resolver board reading for motor position estimation	STEVAL-TTM005A
Control board for automotive motor control applications	STEVAL-TTM002V1
Control board for automotive motor control applications based on SPC58NN84E7	STEVAL-TTM004V1
Mainstream Arm Cortex-M4 MCU 170 MHz with 512 Kbytes of Flash memory	STM32G474RE
200 mA output current with thermal shutdown and output current limiter	TSB582IYDT
Rail-to-rail inputs and outputs, 36 V, 6 MHz op-amps	TSB514IYPT
Applications	Automotive Motor Control

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For further information contact your local STMicroelectronics sales office.

www.st.com

1 Pinout

Figure 1. STEVAL-TTM005V1 pinout

TSB582IYDT
200mA dual op amp

TP1 : TSB582, out1
TP2 : TSB582, out2

12V power connector

LF50CDT-TR
5V LDO for TSB514

TP5 : TSB514 sin+ in
TP10: TSB514 sin- in

TSB514IYPT
R2R quad op amp

TP7 : TSB514 cos+ in
TP11: TSB514 cos- in

CON3 : resolver
1/2: excitation out,
3/4: sin in,
5/6: cos in

2 Schematic diagrams
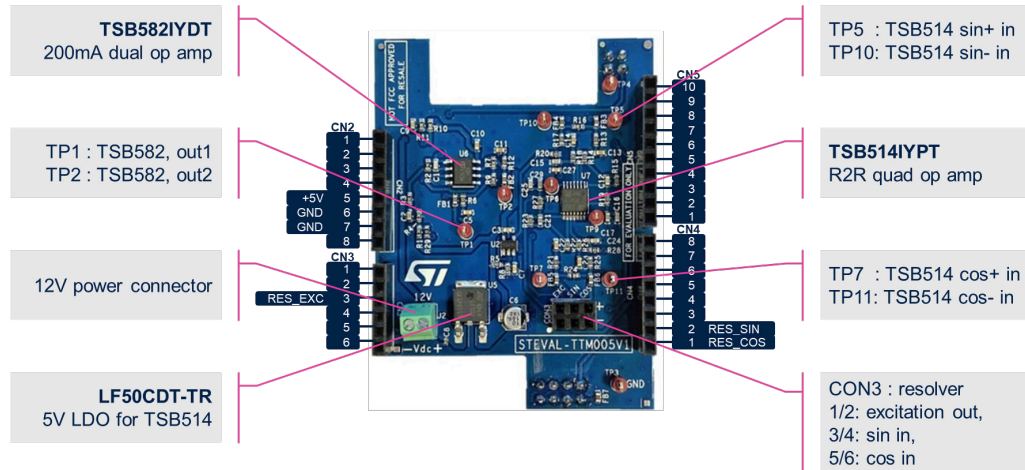
Figure 2. STEVAL-TTM005A circuit schematic
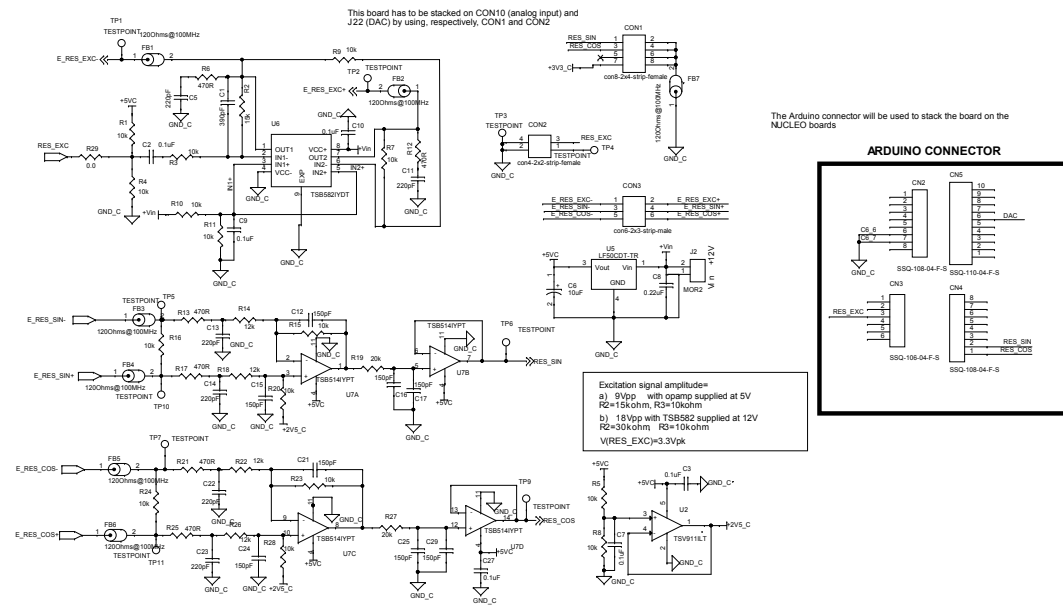
3 Board versions

Table 1. STEVAL-TTM005A versions

Finished good	Schematic diagrams	Bill of materials
STEVAL$TTM005AA [1]	STEVAL$TTM005AA schematic diagrams	STEVAL$TTM005AA bill of materials

1. This code identifies the STEVAL-TTM005A expansion board first version.

Revision history

Table 2. Document revision history

Date	Revision	Changes
14-Mar-2024	1	Initial release.

IMPORTANT NOTICE – READ CAREFULLY