

ACEPACK SMIT in TO240 module form factor



Features

- Ready to test TO240 interface board
- Same pinout as TO240 SCR module
- Easy mount on existing TO240 heatsink
- Same thermal impedance (junction to case) versus TO240
- Thinner profile than TO240
- High current capability
- ACEPACK SMIT is compatible with automatic SMD assembly

Description

The **STEVAL-TO240SCR** is a ready-to-use interface board that features a 60 A dual thyristor. The evaluation board allows evaluating the ACEPACK SMIT package using an existing heatsink and similar screw connection of the TO240 module.

The evaluation board includes four snap-on connectors so that it can directly use the driving wires connected in the TO240 package.

The key product, **STTN6050H-12M1Y**, is an automotive-qualified 60 A 1200 V thyristor assembled in a surface-mounted ACEPACK SMIT package.

It offers 600 A surge peak current and overvoltage robustness V_{DSM} up to 1400 V. It also has an optimized TAB to lead creepage distance of 4 mm. The lead-to-lead creepage distance is 6.9 mm.

This evaluation board is provided as an alternative to **SKKT** series, **MCMA** series, and **VSKT** series of dual **SCR**.

Product summary	
ACEPACK SMIT in TO240 module form factor	STEVAL-TO240SCR
60 A 1200 V thyristor controlled half bridge in ACEPACK SMIT module	STTN6050H-12M1Y
Applications	<ul style="list-style-type: none">• Motor drive soft starter• Solid state relay• 3-phase or 1-phase controlled bridge• AC motor brake

1 Safety instructions

Figure 1. Pictograms



Danger: Use the board only after applying a fire-resistant cover. The cover is not included in the board package.

There is a danger of serious personal injury, property damage, or death due to electrical shock and burn hazards if the kit or components are improperly used or installed incorrectly.

Warning: The kit is not electrically isolated from the high-voltage supply AC-DC input.

The evaluation board is directly linked to the mains voltage. No insulation is ensured between the accessible parts and the high voltage. All measurement equipment must be isolated from the mains before powering the board.

When using an oscilloscope with the evaluation board, it must be isolated from the AC line. This prevents shock from occurring as a result of touching any single point in the circuit, but does not prevent shock when touching two or more points in the circuit.

Caution: During assembly, testing, and operation, the evaluation board poses several inherent hazards, including bare wires, moving or rotating parts and hot surfaces. All operations involving transportation, installation, use, and maintenance must be performed by skilled technical personnel who are familiar with the installation, use, and maintenance of power electronic systems.

The board has to be connected directly on the mains. Non-isolated parts at high-voltage levels are present on both sides of the PCB.

The high current flowing through the two SCRs generates heat: the board temperature can reach up to 150 °C at full power. Be aware that, due to the thermal inertia, the board could remain hot even after the current flow.

Workarea safety:

- The work area must be clean and tidy
- Do not work alone when boards are powered
- Protect the area against any unauthorized access by putting suitable barriers and signs
- A system architecture that supplies power to the evaluation board must be equipped with additional control and protective devices in accordance with the applicable safety requirements (that is, compliance with technical equipment and accident prevention rules).

Electrical safety:

- Remove the power supply from the evaluation board and electrical loads before performing any electrical measurement
- Arrange measurement setup, wiring, and configuration, paying attention to the high voltage section
- Once the setup is complete, power the board. Fuse protection is not included with this evaluation board.

Danger: Do not touch the evaluation board when it is powered or immediately after it has been disconnected from the voltage supply as several parts and power terminals containing potentially energized capacitors need time to discharge, and heat-sink and transformers may still be very hot.

Personal safety:

- Always wear suitable personal protective equipment, such as insulating gloves and safety glasses
- Take adequate precautions and install the board to prevent accidental touch
- Use protective shields, such as an insulating box with interlocks.

2 General specifications

2.1 Pinout and recommendation

Figure 2. STEVAL-TO240SCR main components

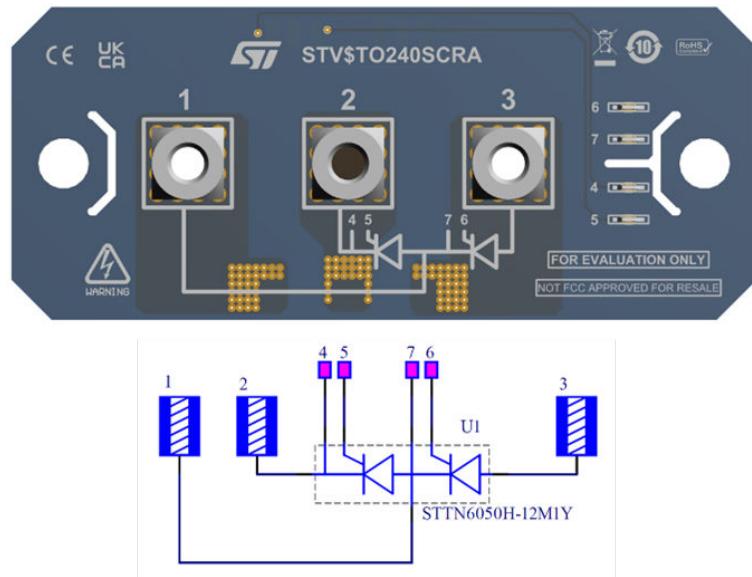


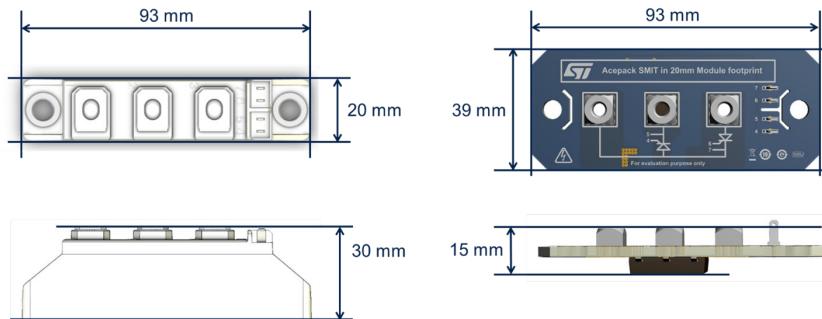
Table 1. Pin assignment

Pins number	Pins reference	Definition
1	A1-C2	Anode SCR1 - Cathode SCR2
2	C1	Cathode SCR1
3	A2	Anode SCR2
4	C1	Cathode SCR1
5	G1	Gate SCR1
6	G2	Gate SCR2
7	C2	Cathode SCR2

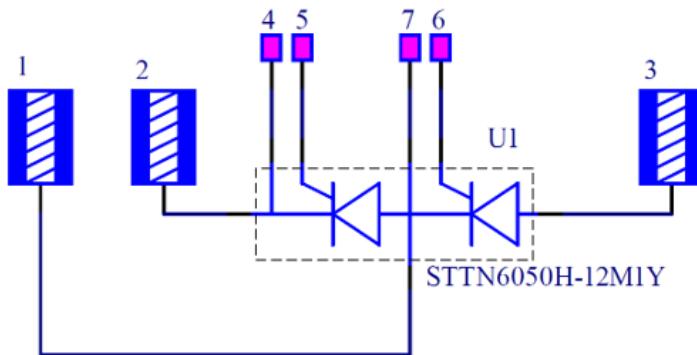
TO240 is an industry-standard power module (93 mm length, 20 mm width, and 30 mm height) using three screw connectors (M5 size) on top and four snap-on connectors to control the SCR. It is manually assembled using two screws to attach the base plate to the heatsink.

As an alternative the ACEPACK SMIT package can be automatically assembled on an SMT production line to reduce the mounting cost and increase production units per hour (uph). This interface board is provided quickly to evaluate the performance of the ACEPACK SMIT package against the TO240 module.

See below the mechanical dimensions of the TO240 and STMicroelectronics interface board.

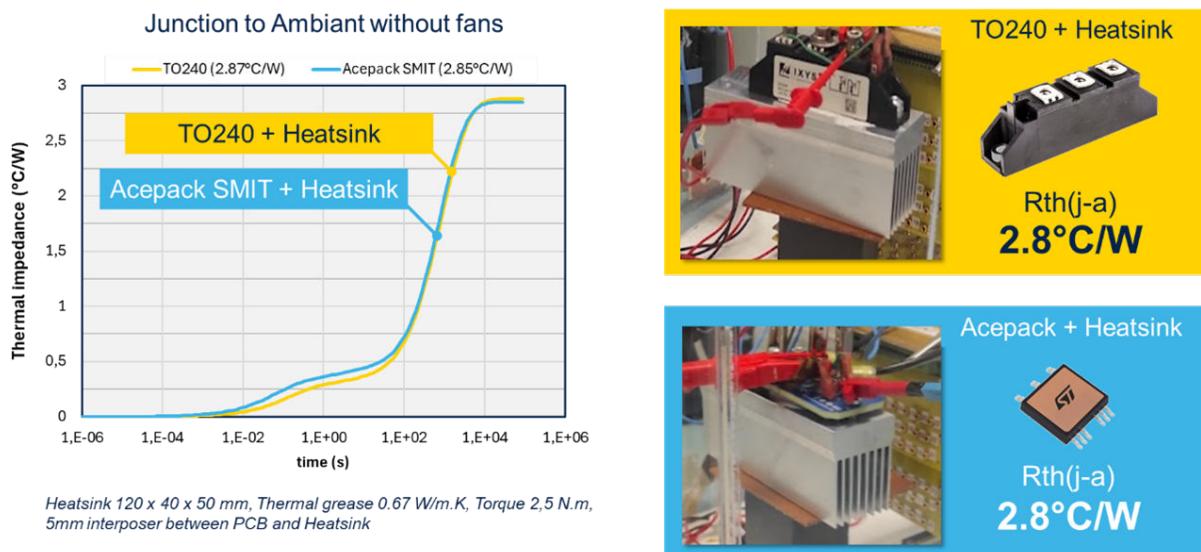
Figure 3. Mechanical dimensions of TO240 and STMicroelectronics interface board


2.2 Schematics

Figure 4. STEVAL-TO240SCR schematic


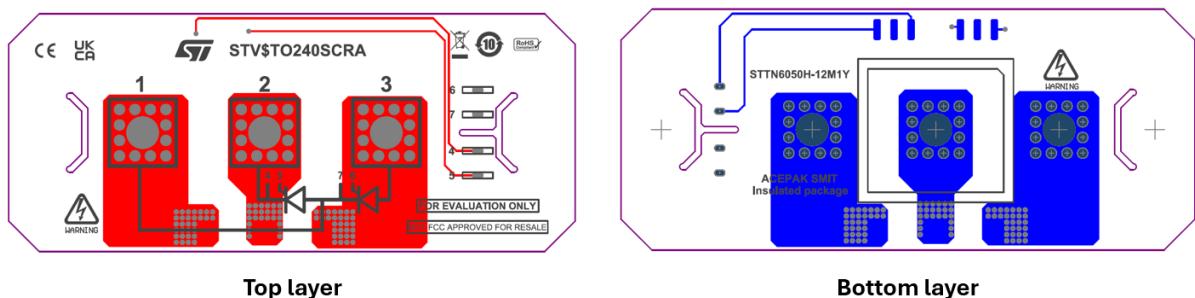
2.3 Thermal impedance

Thermal impedance measurements, according to JESD51-2A, have been made to compare TO240 and ACEPACK SMIT mounted on the same heatsink size (120 x 40 x 50 mm) without forced ventilation. As seen in the graph below, the setup resulted in the same 2.8 °C/W between junction and ambient. The same thermal grease and torque were applied to the TO240 and ACEPACK SMIT interface board. Metal spacers of 5 mm height were placed between the interface PCB and heatsink to limit the mechanical stress applied to the PCB.

Figure 5. Junction to ambient thermal impedance


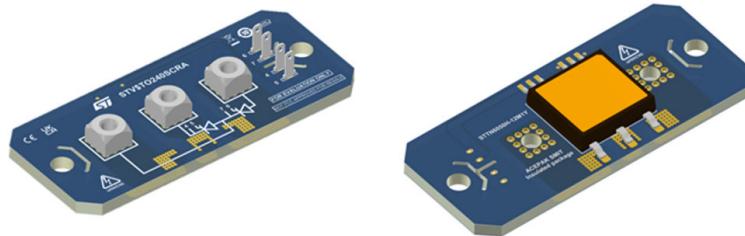
2.4 Layout

Figure 6. STEVAL-TO240SCR layout



2.5 3D views

Figure 7. STEVAL-TO240SCR 3D views



Revision history

Table 2. Document revision history

Date	Revision	Changes
07-May-2025	1	Initial release.

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