



STMicroelectronics STEVAL-C34KAT1 Vibrometer and Temperature Sensor Expansion Kit User Manual

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STMicroelectronics STEVAL-C34KAT1 Vibrometer and Temperature Sensor Expansion Kit



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Introduction

The **STEVAL-C34KAT1** is a multisensing expansion kit that includes the STEVAL-C34AT01 expansion board and a flexible cable.

The small form factor and the accurate design allow a precise measurement of vibrations up to the sensor bandwidth (6 kHz) as well as of the temperature.

The **IIS3DWB** vibration sensor is soldered at the center of the small 25 x 25 mm board. The **STTS22H** temperature sensor is placed on the PCB side and is thermally coupled to the PCB bottom exposed pad through vias.

The expansion board can be mounted on the equipment for the vibration analysis using the four holes or the double-sided adhesive tape. This board is compatible with the STWIN.box kit (**STEVAL STWINBX1**).

Figure 1. STEVAL-C34KAT1 expansion kit



Features

- Kit content:
 - a STEVAL-C34AT01 multisensing expansion board (25x25mm) with a 34-pin board to-FPC connector
 - a 34-pin flexible cable
- Ideal plug-in for the STEVAL-STWINBX1 evaluation board
- Ultra-wide bandwidth (up to 6 kHz), low-noise, 3-axis digital vibration sensor (IIS3DWB):
 - Ultra-wide and flat frequency response range: from DC to 6 kHz (± 3 dB point)
 - Low-pass or high-pass filter with a selectable cut-off frequency
 - 1.1 mA with the three axes at full performance
 - Extended temperature range from -40 to +105°C
- Low-voltage, ultra-low-power, 0.5°C accuracy I²C/SMBus 3.0 temperature sensor (STTS22H)
 - Programmable thresholds through an interrupt pin
 - Ultra-low current: 1.75 μ A in one-shot mode
 - Operating temperature -40 to +125°
- Exposed pad on the bottom side to improve the thermal coupling for the temperature sensor
- 2.1 to 3.3 V power supply input

Precautions for use

Important: This kit is not immune to indirect electrostatic discharges. During the ESD test, the kit has obtained level C. This means that the expansion board has not been damaged during the test, but the intervention of the operator was necessary to reset it. When an electrostatic discharge is applied to an adjacent object, the board might interrupt its functioning. In this case, the intervention of an operator is required to reset the board (that is, to unplug and replug the power supply line).

If the board is attached to a **STEVAL-STWINBX1** (STWIN.box), you can control the power supply of the external 34-pin connector via software, by leveraging the power switch functionality of the **STBC02** battery charger IC.

The STEVAL-C34KAT1 expansion board can be used with the STEVAL-STWINBX1 kit (STWIN box).

The device can be attached to the STWIN. box using the provided flexible cable, through the 34-pin connectors available on both platforms.

Figure 2. Expansion board and flexible cable



To plug the flexible cable onto the STWIN. box, remove the plastic case cover.

Figure 3. Plugging the flexible cable onto the STWIN. box



You can then remount the cover, as it leaves enough space for the flexible cable

Figure 4. Final setup



The easiest way to read data from the STEVAL-C34KAT1 sensors is to flash the STWIN. box with the FP-SNSDATALOG2 function pack compiled with the external sensor option. The firmware package provides a ready to use, precompiled binary.

Adhesive tape

The kit provides a few samples of 3M™ 9088 high performance, double coated tape. These samples can be used to mount the board on the equipment for vibration analysis.

Alternatively, you can mount the board through the holes located at each corner of the PCB.

The small form factor of the PCB ensures no resonances and a flat frequency response for the complete

bandwidth of the sensor (up to 6 kHz).

Schematic diagrams

Figure 5. STEVAL-C34KAT1 circuit schematic: STEVAL-C34AT01

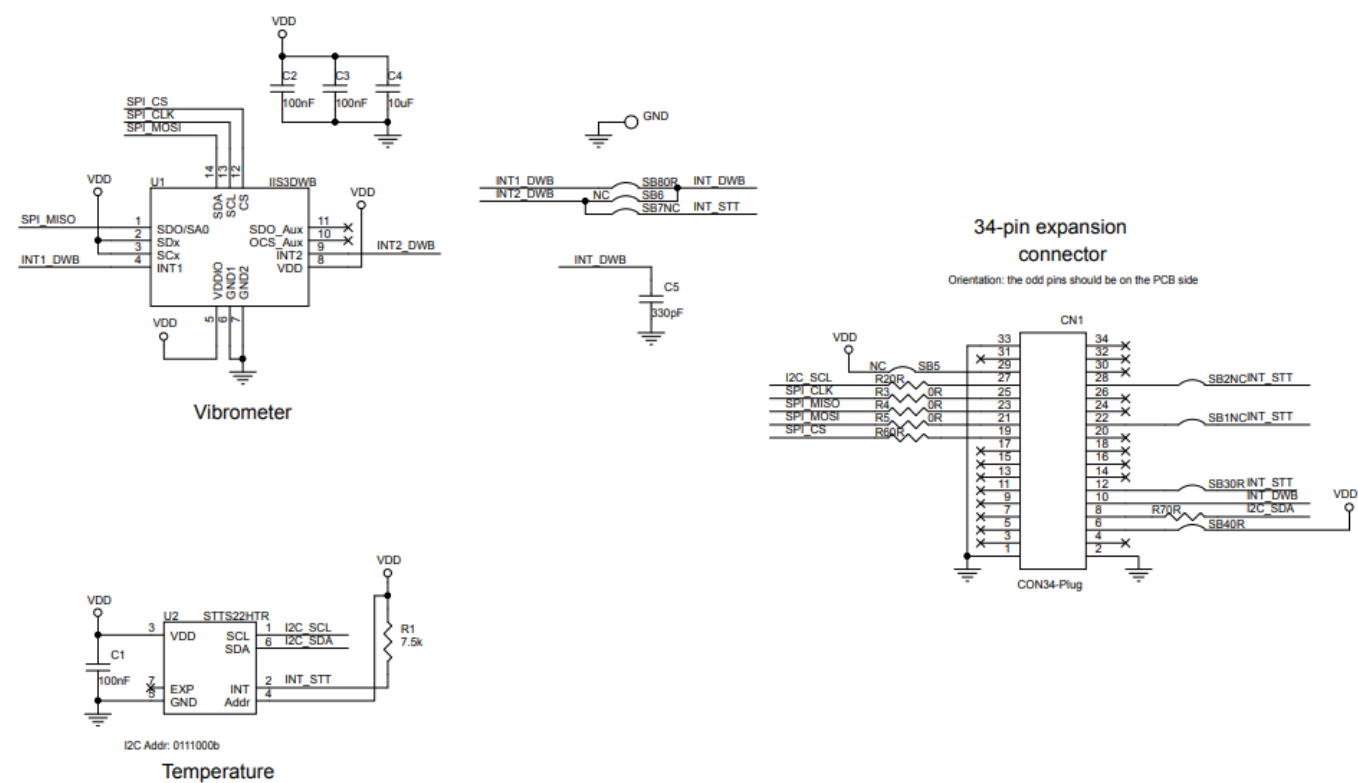
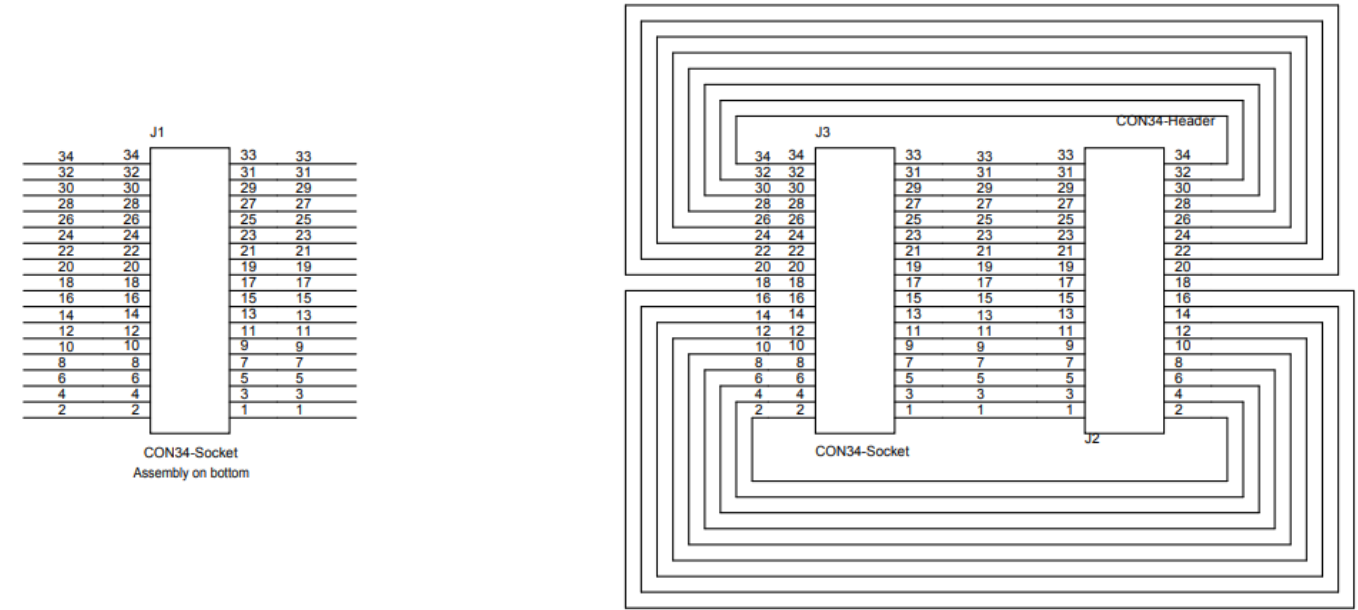


Figure 6. STEVAL-C34KAT1 circuit schematic: STEVAL-FLTCB01



Bill of materials

Table 1. STEVAL-C34KAT1 bill of materials

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
1	1	Table 2. Expansion board bill of materials	STEVAL- C34 AT01	Vibrometer and temperature expansion board	ST	Not available for separate sale
2	1	Table 3. Flexible cable bill of materials	STEVAL- FLT CB01	34-pin, 15 cm flexible cable	ST	Not available for separate sale
3	4	—	3M 9088 – 25 ×25 mm, 25×25 mm	3M™ high performance, double coated tape	3M	9088

Table 2. Expansion board bill of materials

Item	Q.ty	Ref.	Value	Description	Manufacturer	Order code

1	1	CN1	CON34-Plug, 34 positions, SMD, gold	Connector socket	Panasonic Electronic Works	AXF6G3412A
2	3	C1, C2, C3	100 nF, 0402 (1005 metric), 16 V, $\pm 10\%$, X7R	Ceramic capacitors	Murata Electronics North America	GRM155R71C104KA8 8J
3	1	C4	10 μ F, 0402 (1005 metric), 10 V, $\pm 20\%$, X5R	Ceramic capacitor	Samsung Electro-Mechanics America, Inc.	CL05A106MP8NUB8
4	1	C5	330pF, 0402 (1005 Metric), 10%,	CAP CER 330 pF	Murata Electronics North America	GRM1555C1H331GA0 1D
5	1	R1	7.5 k, 0402 (1005 metric), 1/16 W, $\pm 5\%$, SMD	Resistor	Yageo	RC0402JR-077K5L

6	9	R2, SB3, R3, SB4, R4, R5, R6, R7, SB8	0 R, 0402 (1005 metric), SMD	Resistors	Vishay Dale	CRCW04020000Z0ED
7	0	SB1, SB2, SB5, SB6, SB7	0 ohm, 0402 (1005 metric), SMD	Resistors (not mounted)	Vishay Dale	CRCW04020000Z0ED
8	1	U1	IIS3DWBTR, VFLGA2.5X3X.8 6 14L P.5 L. 475X.25	Ultra-wide bandwidth, low-noise, 3-axis digital vibration sensor	ST	IIS3DWBTR
9	1	U2	STTS22HTR, UDFN 2X2X.55 6L pitch 0.65	Low-voltage, ultra-low-power, 0.5°C accuracy I ² C/SMBus 3.0 temperature sensor	T	STTS22HTR

Table 3. Flexible cable bill of material

Item	Q.ty	Ref.	Part/value	Description	Manufacturer	Order code
1	1	J2	CON34-Header, 34 positions, SMD, gold	Connector header	Panasonic Electric Works	AXF5G3412A
2	2	J1, J3	CON34-Socket, 34 positions, SMD, gold	Connector sockets	Panasonic Electric Works	AXF6G3412A

Kit versions

Table 4. STEVAL-C34KAT1 versions

PCB version	Schematic diagrams	Bill of materials
STEVALC34KAT1A (1)	STEVALC34KAT1A schematic diagrams	STEVALC34KAT1A bill of materials

Regulatory compliance information

Formal Notice Required by the U.S. Federal Communications Commission

FCC NOTICE

This kit is designed to allow:

(1) Product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and (2) Software developers to write software

applications for use with the end product.


This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of this chapter, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter 3.1.2.

Table 5. Document revision history

Date	Revision	Changes
15-Dec-2022	1	Initial release.



Documents / Resources

	STMicroelectronics STEVAL-C34KAT1 Vibrometer and Temperature Sensor Expansion Kit [pdf] User Manual STEVAL-C34KAT1 Vibrometer and Temperature Sensor Expansion Kit, STEVAL-C34KAT1, Vibrometer and Temperature Sensor Expansion Kit, Temperature Sensor Expansion Kit, Sensor Expansion Kit, Expansion Kit
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References

- [STMicroelectronics: Our technology starts with you](#)
- [STMicroelectronics Trademark List - STMicroelectronics](#)
- [IIS3DWB - Ultra-wide bandwidth, low-noise, 3-axis digital vibration sensor - STMicroelectronics](#)
- [STBC02 - Li-Ion linear battery charger with LDO, load switches and reset generator - STMicroelectronics](#)
- [STEVAL-C34KAT1 - Vibrometer and temperature sensor expansion kit - STMicroelectronics](#)
- [STEVAL-STWINBX1 - STWIN.box - SensorTile Wireless Industrial Node Development Kit - STMicroelectronics](#)
- [STTS22H - Low-voltage, ultra-low-power, 0.5 °C accuracy I2C/SMBus 3.0 temperature sensor - STMicroelectronics](#)