

# HDC3020FLX Evaluation Module User's Guide

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## Description

The HDC3020FLXEVM is a Flexible Print Circuit (FPC) based breakout sensor board. It enables users to evaluate the performance of the [HDC3020](#) digital relative humidity (RH) and temperature sensor on a compact and easy to use circuit board.

## Get Started

1. Order the HDC3020FLXEVM on [ti.com](https://www.ti.com)
2. Solder wires to the exposed gold fingers of the HDC3020FLXEVM
3. Refer to the [HDC3020 datasheet](#) for IC details
4. Visit our [E2E forums](#) for support or questions

## Features

- Diverse array of applications due to light and compact footprint of evaluation module
- Plug and play capability allows users to implement sensor in any system with I2C interface
- Low thermal mass enables faster temperature and humidity response times as well as a quicker response from the integrated heater

## Applications

- [Washer & dryer](#)
- [Refrigerator & freezer](#)
- [Industrial transport](#)
- [IoT environmental sensors](#)
- [Air quality and gas detection](#)
- [Humidifier/dehumidifier](#)
- [Thermostat](#)
- [CPAP and ventilator](#)
- [Water leak detector](#)
- [IP Camera](#)



# 1 Evaluation Module Overview

## 1.1 Introduction

The HDC3020FLXEVM is a 25.4mm long FPC based evaluation board. One end of the board contains the HDC3020 device along with a 0.1uF bypass capacitor. The opposite end of the board has four exposed gold fingers enabling the user to solder wires of desired length to suite their application. Since there is no digital front end, the HDC3020FLXEVM requires a host device with an I2C interface to read temperature and humidity data. The HDC3020FLXEVM's device address is fixed to 0x44 and cannot be reconfigured. The Alert and Reset pins are unavailable on the HDC3020FLXEVM.



Figure 1-1. HDC3020FLXEVM Board Sections

## 1.2 Kit Contents

Table 1-1 details the contents of the EVM kit. Contact the nearest Texas Instruments Product Information Center for missing components. TI highly recommends checking the TI [website](#) for the latest revision.

Table 1-1. Kit Contents

Item	Quantity
HDC3020FLXEVM	1

## 1.3 Specification

Table 1-2. HDC3020FLXEVM Operating Conditions

Board Section	Conditions	Temperature Range
EVM Board	Temperature Sensor	-40°C to 125°C
	Relative Humidity Sensor	-20° to 80°C

## 1.4 Device Information

The HDC3020 is an integrated, capacitive based relative humidity (RH) and temperature sensor. The device provides high accuracy measurements over a wide supply range (1.62V – 5.5V) and ultra low power consumption in a compact 2.5mm × 2.5mm × 0.8mm WSON 8-pin package. Both the temperature and humidity sensors are 100% tested and trimmed on a production setup that is NIST traceable and verified with equipment that is calibrated to ISO/IEC 17025 standards.

## 1.5 Interface Example

The HDC3020FLXEVM can be paired with the existing [HDC3020EVM](#) and can be evaluated using the HDC3020EVM's [GUI](#). By separating the existing sensor module from the HDC3020EVM, a user can solder wires

from the HDC3020FLXEVM to the HDC3020's digital front end. This makes for a quick and easy evaluation of the flex sensor module, before moving on to testing in end equipment.

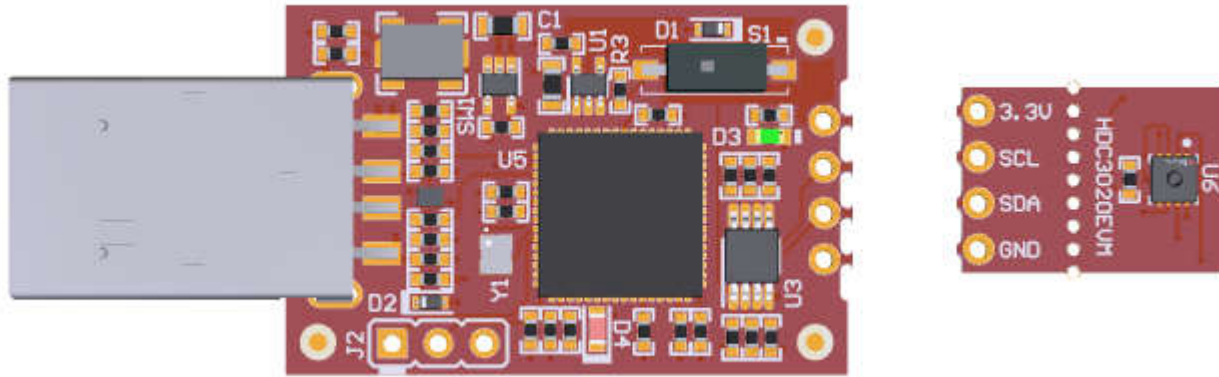


Figure 1-2. HDC3020EVM Breakable Section

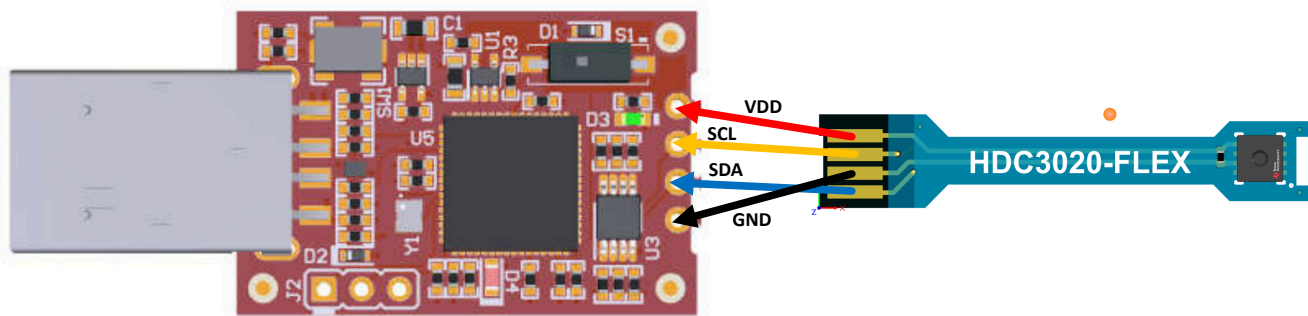


Figure 1-3. Soldering HDC3020FLXEVM to HDC3020EVM

## 2 Hardware Design Files

### 2.1 Schematic

Figure 2-1 illustrates the EVM schematic.

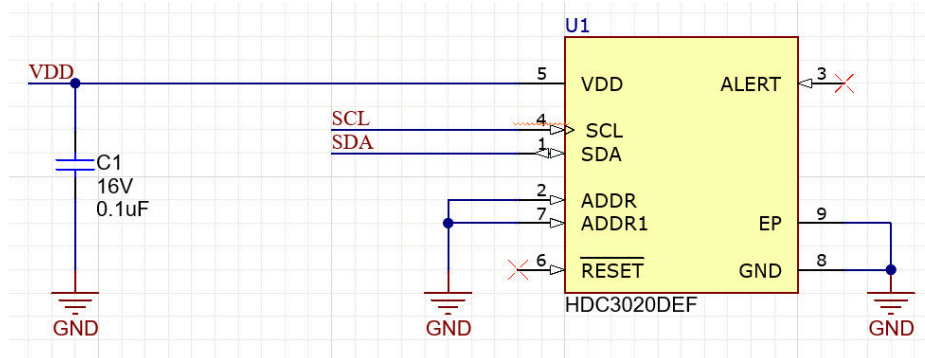


Figure 2-1. HDC3020FLXEVM Schematic

### 2.2 PCB Layouts

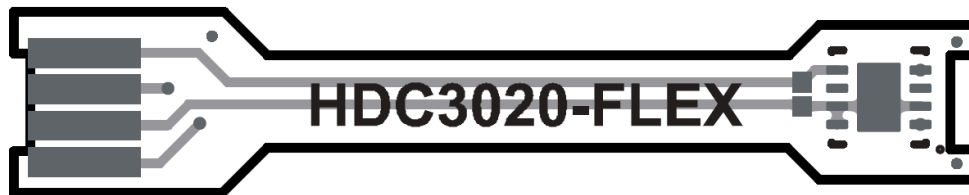


Figure 2-2. PCB Top

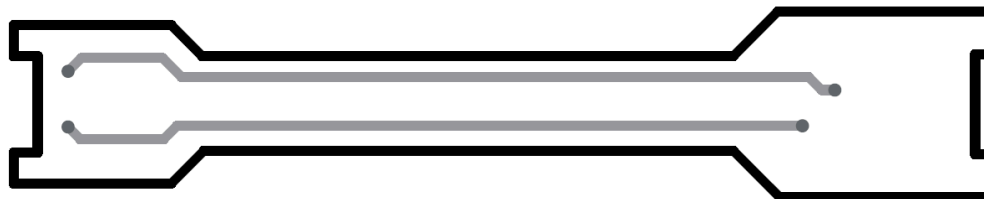


Figure 2-3. PCB Bottom

### 2.3 Bill of Materials (BOM)

Table 2-1 lists the HDC3020FLXEVM bill of materials (BOM).

Table 2-1. HDC3020FLXEVM Bill of Materials

Designator	Qty	Value	Description	Package Reference	Part Number	Manufacturer
C1	1	0.1µF	CAP, CERM, 0.1 uF, 16 V,+/- 10%, X7R, 0201	0201	GRM033Z71C104KE14D	MuRata
U1	1		Integrated Humidity and Temperature Digital Sensor	WSON8	HDC3020DEF	Texas Instruments

## 3 Additional Information

### 3.1 Trademarks

All trademarks are the property of their respective owners.

## 4 Related Documentation

The following document provides information regarding Texas Instruments integrated circuits used in the assembly of the HDC3020FLXEVM. This user's guide is available from the TI website under literature number SBOU320. Any letter appended to the literature number corresponds to the document revision that is current at the time of the writing of this document. Newer revisions can be available from the TI website at <http://www.ti.com/>, or call the Texas Instruments Literature Response Center at (800) 477-8924 or the Product Information Center at (972) 644-5580. When ordering, identify the document by both title and literature number.

**Table 4-1. Related Documentation**

Device	Literature Number
<a href="#">HDC3020</a>	SNAS778
<a href="#">HDC302x Silicon Users Guide</a>	SNAU265

## 5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision * (November 2024) to Revision A (December 2025)	Page
• Updated hardware image.....	1
• Updated <a href="#">Figure 1-1</a> .....	2
• Updated <a href="#">Figure 1-2</a> and <a href="#">Figure 1-3</a> .....	2
• Updated <a href="#">Figure 2-1</a> .....	4
• Updated <a href="#">Figure 2-2</a> and <a href="#">Figure 2-3</a> .....	4

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**NOTE:**

**EXPOSURE TO ELECTROSTATIC DISCHARGE (ESD) MAY CAUSE DEGRADATION OR FAILURE OF THE EVALUATION KIT; TI RECOMMENDS STORAGE OF THE EVALUATION KIT IN A PROTECTIVE ESD BAG.**

### 3 Regulatory Notices:

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##### 3.1.1 Notice applicable to EVMs not FCC-Approved:

**FCC NOTICE:** This kit is designed to allow 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 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 For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant:

#### **CAUTION**

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

#### **FCC Interference Statement for Class A EVM devices**

*NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

#### **FCC Interference Statement for Class B EVM devices**

*NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

#### 3.2 Canada

##### 3.2.1 For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210 or RSS-247

#### **Concerning EVMs Including Radio Transmitters:**

This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:

(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

#### **Concernant les EVMs avec appareils radio:**

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

#### **Concerning EVMs Including Detachable Antennas:**

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

### Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

#### 3.3 Japan

3.3.1 *Notice for EVMs delivered in Japan:* Please see [http://www.tij.co.jp/lstds/ti\\_ja/general/eStore/notice\\_01.page](http://www.tij.co.jp/lstds/ti_ja/general/eStore/notice_01.page) 日本国内に輸入される評価用キット、ボードについては、次のところをご覧ください。

<https://www.ti.com/ja-jp/legal/notice-for-evaluation-kits-delivered-in-japan.html>

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If User uses EVMs in Japan, not certified to Technical Regulations of Radio Law of Japan, User is required to follow the instructions set forth by Radio Law of Japan, which includes, but is not limited to, the instructions below with respect to EVMs (which for the avoidance of doubt are stated strictly for convenience and should be verified by User):

1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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Last updated 10/2025