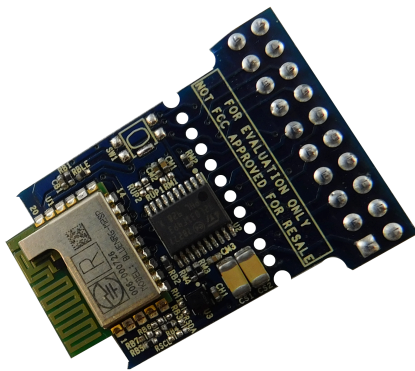


Battery-free light sensor tag based on STM32L0 and BlueNRG-2



Fully assembled board developed for performance evaluation only, not available for sale

Features

- Wireless energy autonomous light sensor
- Limit of detection > 200 lux
- Bluetooth low energy communication
- Communication range: 5 meters
- Tag size: 2 cm x 2 cm
- Tag thickness: < 4 mm
- Tag weight: < 5 g
- Radio activity control
- Advertising time control
- Over-the-air configuration

Description

The STDES-BFTAG01 is an energy autonomous and battery-free wireless sensor.

The companion STPVTAG app is available for free download on Google Play.

The device implements off-the-shelf components (2 x 2-cm PCB, 4 mm thickness, weight <5 grams).

It features Bluetooth low energy (BLE) communication and can harvest and sense indoor ambient light with a limit of detection of 200~lux.

The board is energetically autonomous thanks to a photovoltaic transducer that simultaneously provides power and light sensing functionality, together with time domain read-out.

The number of tag transmissions to a remote base station, in a given time interval, proportionally varies in relation with light intensity, that is, more light is equal to more frequent broadcasts.

Therefore, the battery-free tag expresses light intensity as a function of time and this phenomenon can be exploited by the base station to convert transmission intervals into accurate expressions of light intensity.

The same concept can be extended to other sources of ambient energy, such as kinetics, thermal, etc.

The STDES-BFTAG01 is a fully assembled board developed for performance evaluation only, not available for sale.

Product summary	
Energy autonomous and battery-free wireless sensor	STDES-BFTAG01
32-bit ultra-low-power MCU	STM32L0
Bluetooth low energy wireless system-on-chip	BlueNRG-2
Applications	Lighting sensors

1 Schematic diagrams

Figure 1. STDES-BFTAG01 circuit schematic (1 of 4)

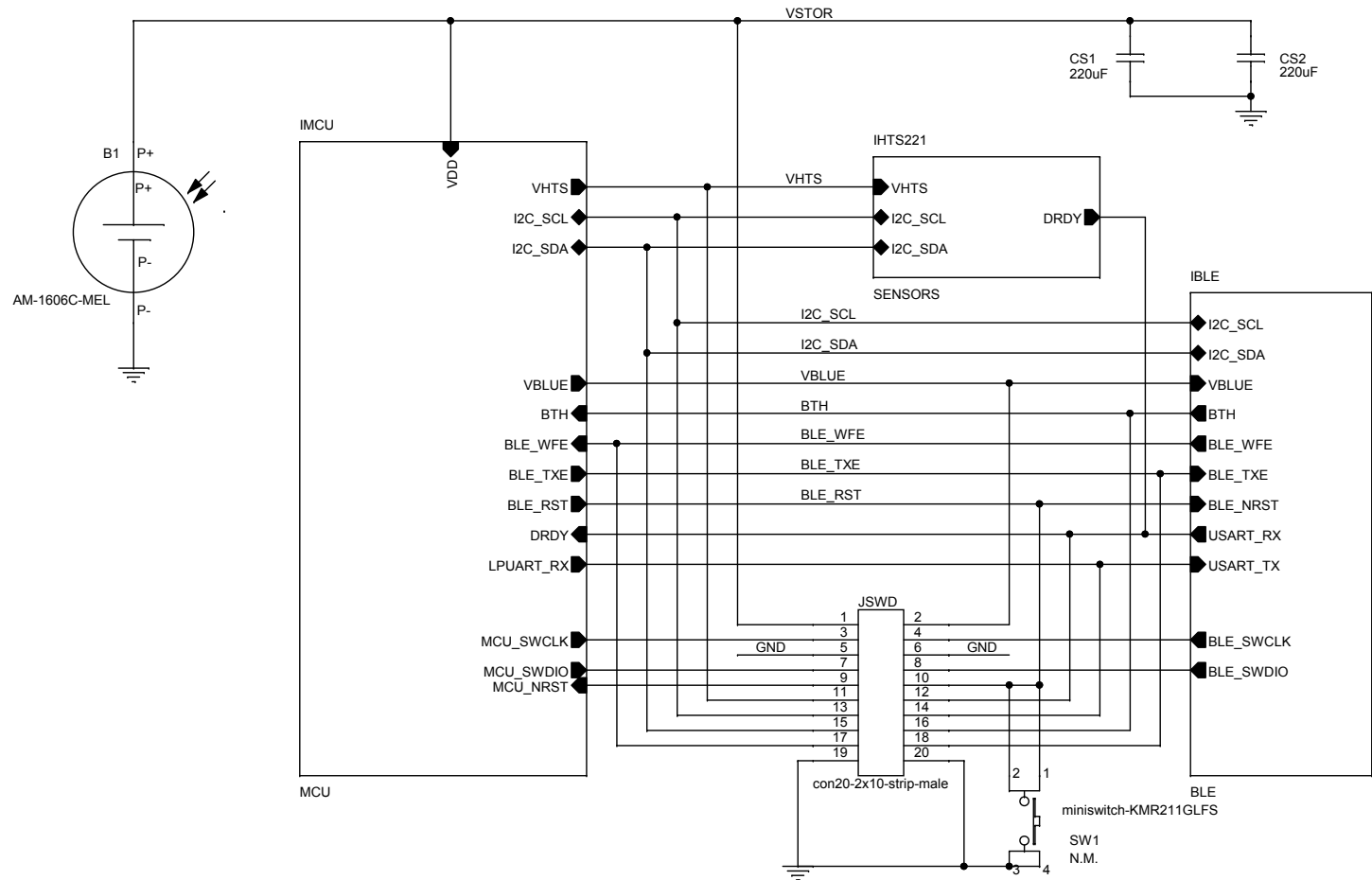


Figure 2. STDES-BFTAG01 circuit schematic (2 of 4)

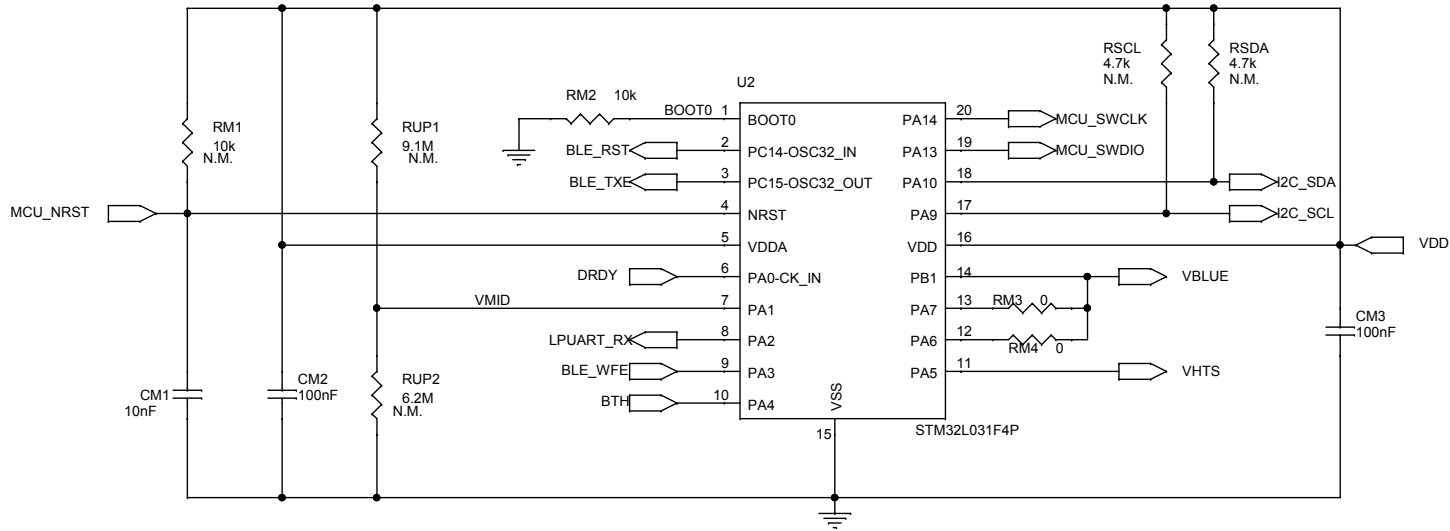
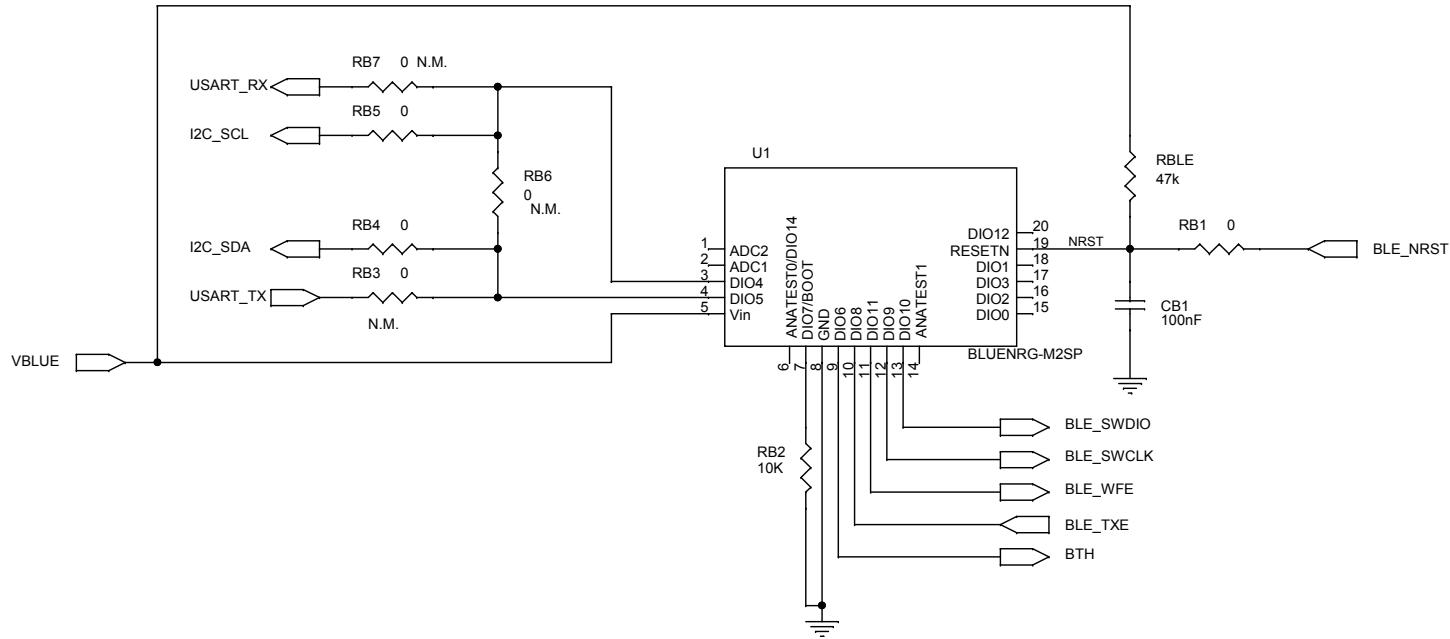
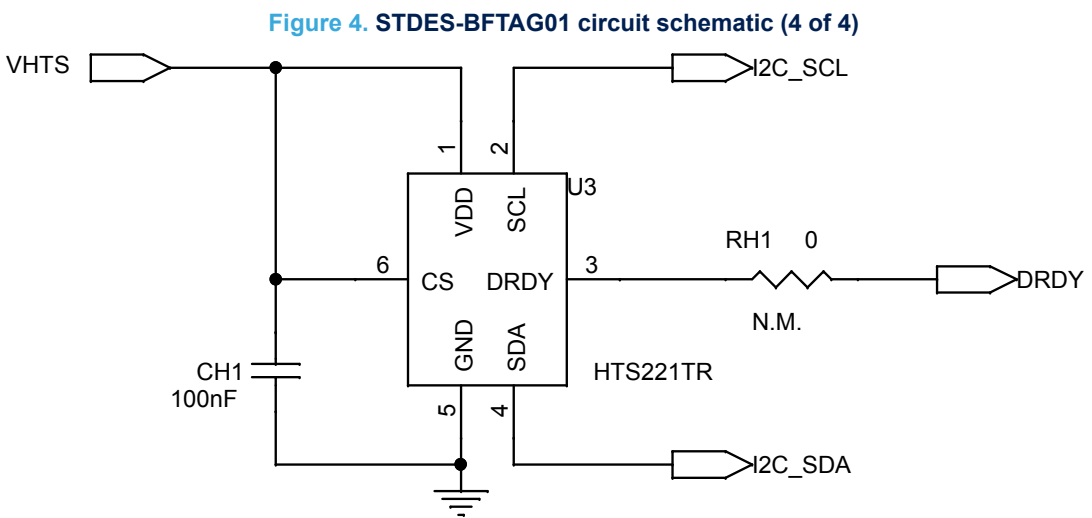


Figure 3. STDES-BFTGA01 circuit schematic (3 of 4)





Revision history

Table 1. Document revision history

Date	Revision	Changes
19-Apr-2021	1	Initial release.
11-May-2021	2	Updated cover image. Updated description

IMPORTANT NOTICE – PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, please refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2021 STMicroelectronics – All rights reserved