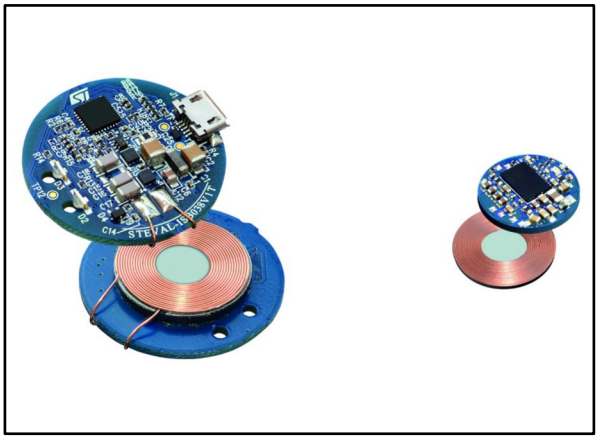
STEVAL-ISB038V1

1 W wearable wireless power system based on STWBC-WA and STWLC04

Data brief



Features

- Wearable KIT characteristics:
  - 11 mm coil on Receiver
  - 20 mm coil on Transmitter
  - 1 Watt delivered on Receiver side
  - USB 5 V input
  - Foreign Object Detection (FOD) optional
  - Graphical interface for monitoring behavior
  - Total reference design
  - RoHS compliant
- STWBC-WA Wireless power transmitter:
  - Cost effective Half Bridge topology with integrated drivers
  - Optional Full Bridge configuration for 3 W applications
  - Active presence detector
  - 2-layer PCB to facilitate design
  - Turnkey solution or customizable via APIs
  - Parametric customization via Graphical interface
- STWLC04 wireless power receiver:
  - Output voltage: 5 V regulated voltage
  - Integrated high efficiency synchronous rectifier
  - Li-Ion/Li-Pol charger functionality
  - 4-layer PCB to facilitate design

Description

The STEVAL-ISB038V1 is a wireless battery charger reference design evaluation kit designed for ultra-compact battery operated devices, such as wearable gear, smartwatches, Internet of Things sensors and healthcare devices.

The design is optimized for 1-watt wireless power transfer with a half-bridge topology on the transmitter side and with tiny 11 mm and 20 mm coils on the receiver and transmitter sides, respectively. For power transfers up to 3 watts, the design can be modified by using larger coils and a full-bridge configuration on the transmitter.

The STWBC-WA transmitter can support a cost-effective half-bridge topology (full-bridge optional) and a powerful software API lets you modify the behavior of LED and general purpose IOs as well as connecting external peripherals or devices like sensors to the design via the on-chip I²C and UART ports.

The STWLC04 is designed for 1-watt power transfer based on the Qi protocol, with digital control and precise analog control loops ensuring stable operation. The I²C interface allows a high degree of customization and settings can be stored in the embedded non-volatile memory.

1 Continued description

The STWLC04 receiver can deliver the output power in the following modes:

1. as a power supply with configured output voltage
2. as a CC/CV battery charger with configurable charging current and voltage.

The full kit includes the STWBC-WA demo board; the STWLC04 demo board; the graphical interface to monitor the transmitter behavior; schematics, layout files and bill of materials.

Tools for the STEVAL-ISB038V1 are available on www.st.com for users to access runtime information such as delivered power and protocol status, and to adjust certain parameters.

2 Transmitter schematic diagrams

Figure 1: STEVAL-ISB038V1T transmitter control stage

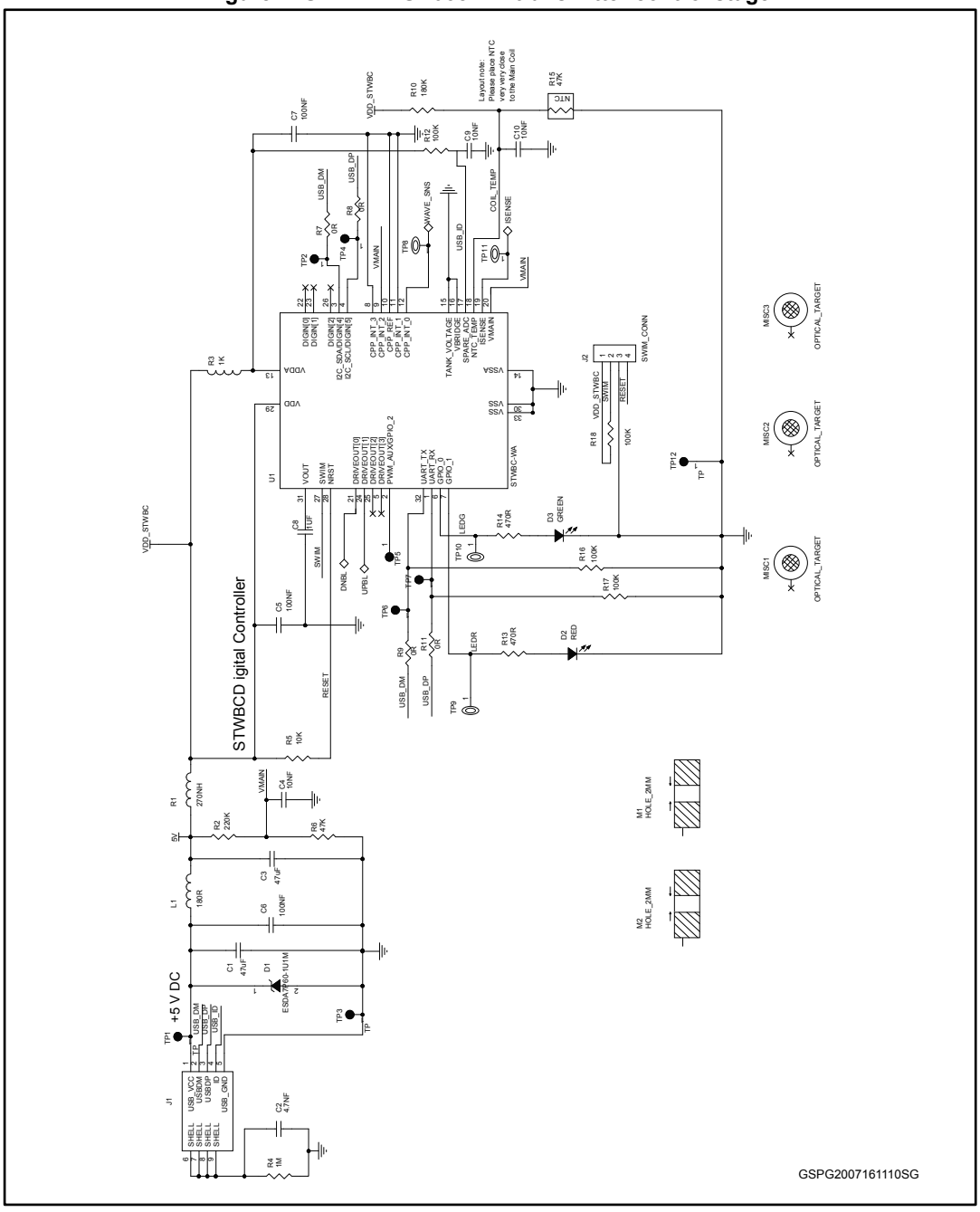


Figure 2: STEVAL-ISB038V1T transmitter power stage

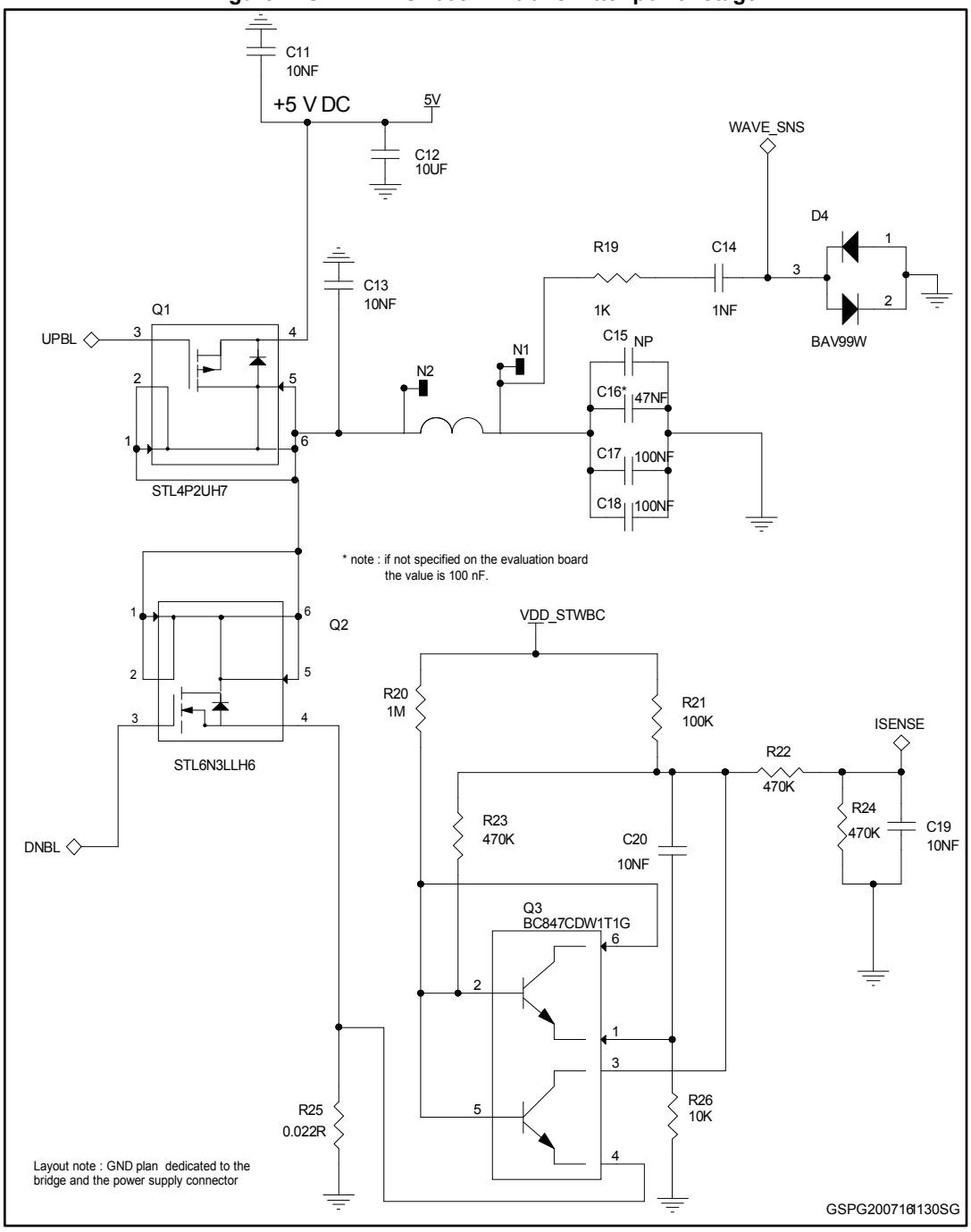
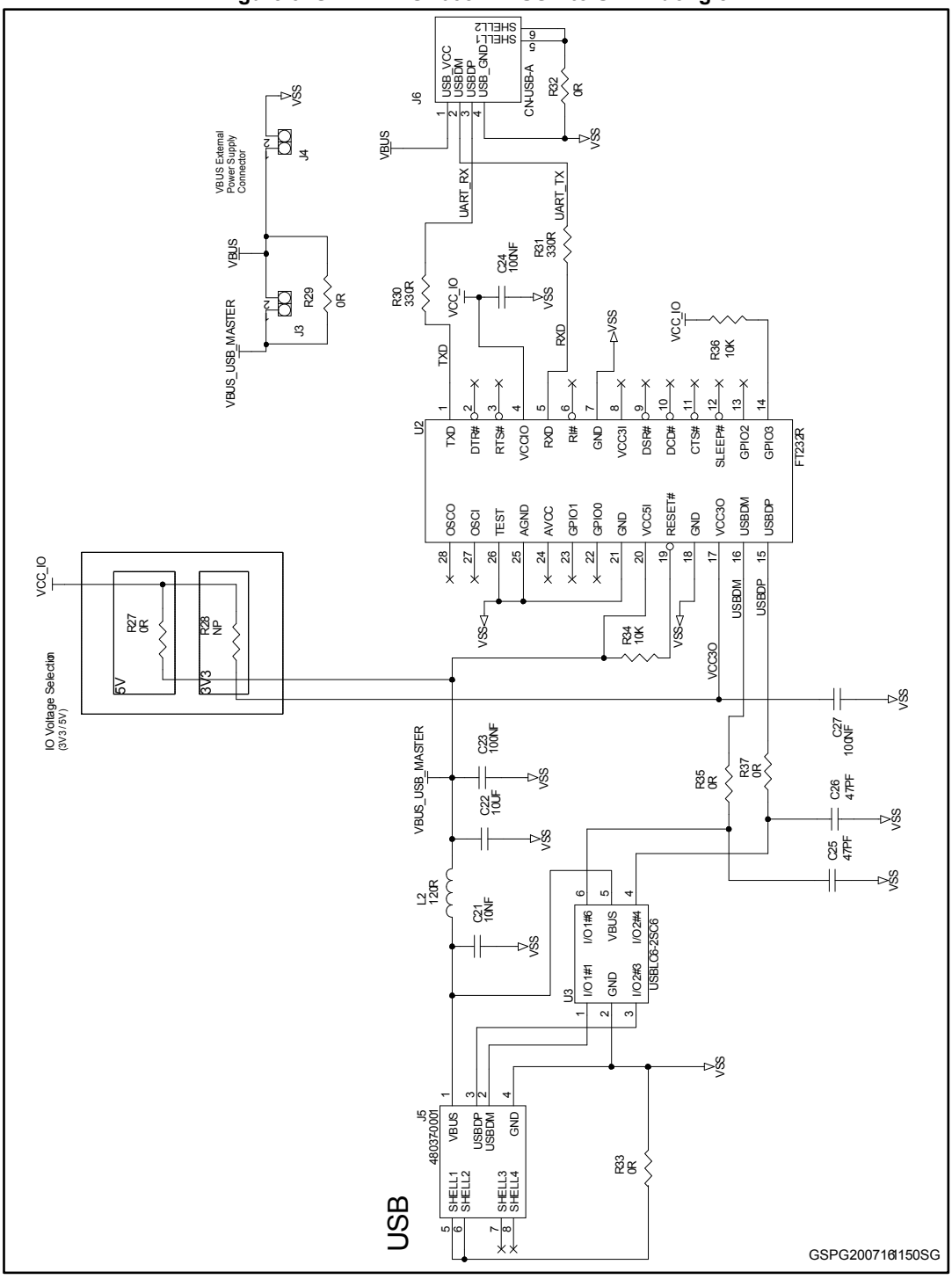


Figure 3: STEVAL-ISB038V1T USB to UART dongle



3 Receiver schematic diagrams

Figure 4: STEVAL-ISB038V1R receiver board

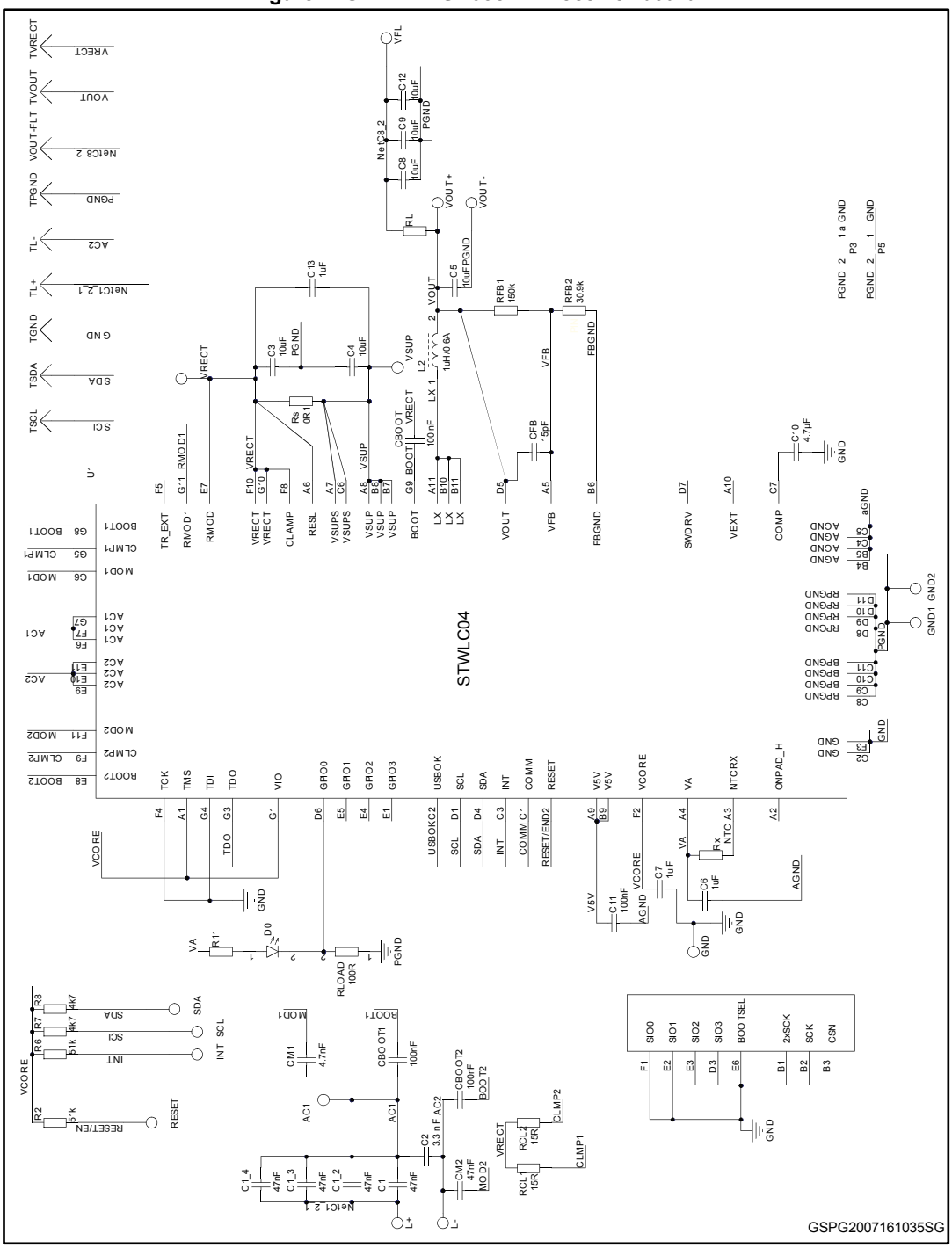
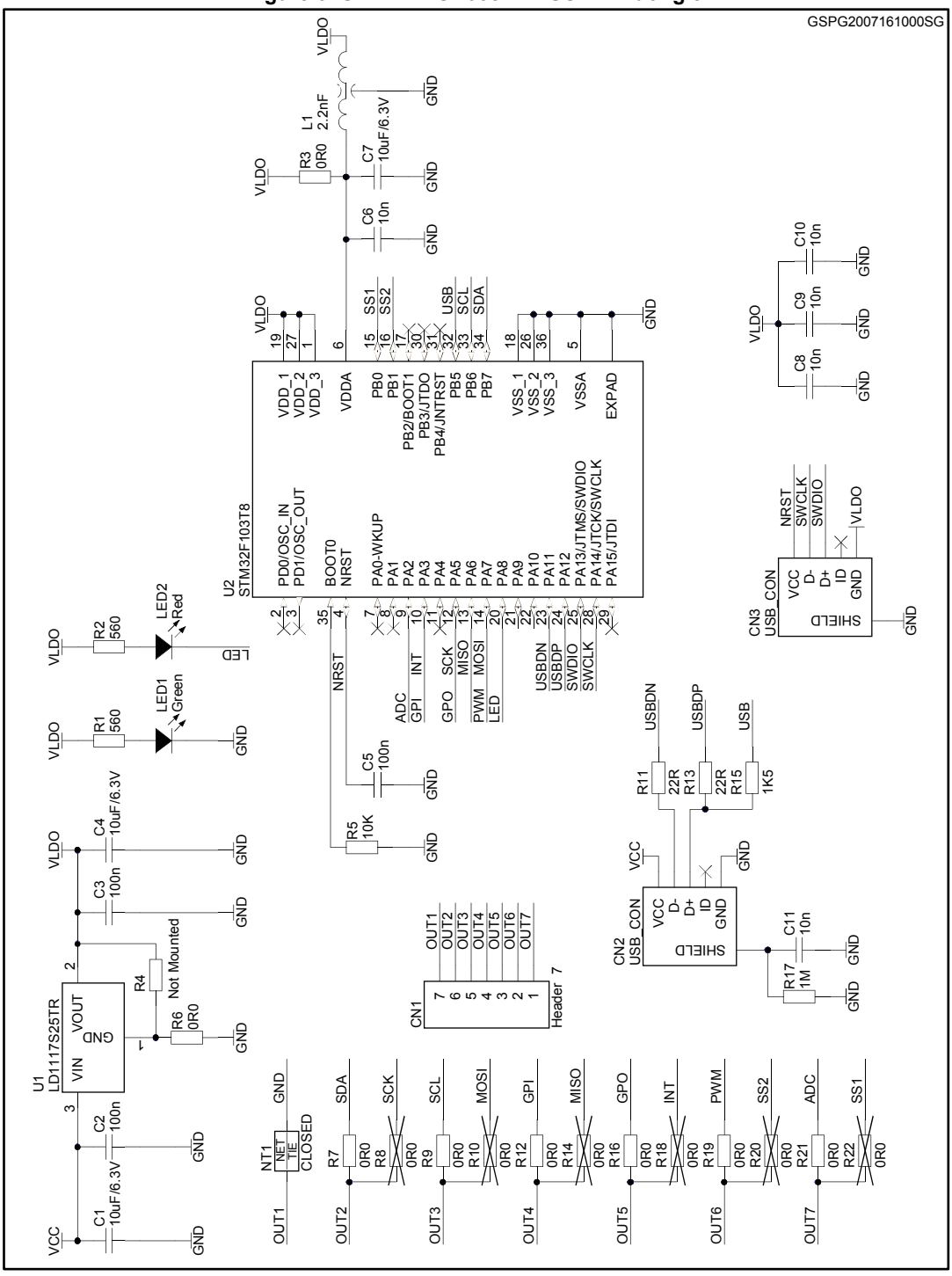


Figure 5: STEVAL-ISB038V1R USB-I²C dongle



4 Revision history

Table 1: Document revision history

Date	Version	Changes
03-Aug-2016	1	Initial release.
05-Aug-2016	2	Updated board photo on the cover page.
21-Nov-2016	3	Updated board photo on the cover page.

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