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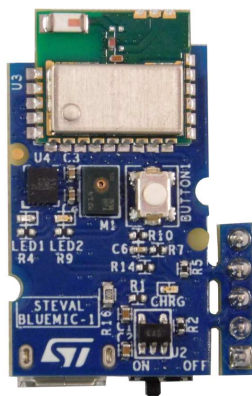

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Ultra-low power Bluetooth® low energy microphone based on SPBTLE-1S certified module

Features

- Bluetooth® SMART small form factor board based on the SPBTLE-1S module, Bluetooth v4.2 compliant
- On-board SPBTLE-1S module, based on BlueNRG-1, Bluetooth low energy application processor system on chip embedding:
    - an ultra-low power ARM® Cortex®-M0 32-bit core architecture
    - programmable embedded 160 KB Flash
    - 24 KB embedded RAM with data retention
- On-board MP34DT05-A (or MP34DT04-C1 in the first generation board) digital MEMS microphone
- On-board LSM6DSL: MEMS 3D accelerometer (±2 / ±4 / ±8 / ±16 g) plus 3D gyroscope (±125 / ±245 / ±500 / ±1000 / ±2000 dps)
- Voltage supply: 1V8 or 3V3
- Battery or USB powered
- 100 mAh Li-Ion battery
- On-board STBC08 linear Li-Ion battery charger
- SWD connector
- Included in the development kit package:
    - STEVAL-BLUEMIC-1
    - Plastic box for housing STEVAL-BLUEMIC-1
    - 100 mAh Li-Ion battery
    - SWD programming cable
- SW development kit for audio and inertial MEMS data streaming over BLE
- ST BlueMS: Android and iOS demo App available in the respective stores
- CE certified
- RoHS and China RoHS compliant
- Contains Transmitter Module FCC (ID: S9NSPBTLE1S) certified
- Contains Transmitter Module IC (IC: 8976C-SPBTLE1S) certified

Description

The STEVAL-BLUEMIC-1 evaluation board mounts the SPBTLE-1S Bluetooth® SMART application processor compliant with BT specification v4.2. It supports multiple simultaneous roles and can act as a Bluetooth Smart master and slave device at the same time.

This BLE wireless battery powered solution also embeds digital MEMS microphone MP34DT05-A (or MP34DT04-C1 in the first generation board) and 3D accelerometer + 3D gyroscope, which render this evaluation board suitable for a wide range of advanced smart applications.

The evaluation board comes with a SW development kit that includes the Bluetooth low energy stack, all the drivers for audio and inertial data acquisition, and button and LED management. A ready-to-use BlueVoice library is included as middleware and a sample application is provided to get you started with voice streaming over BLE to an Android or iOS device, running the ST BlueMS apps.

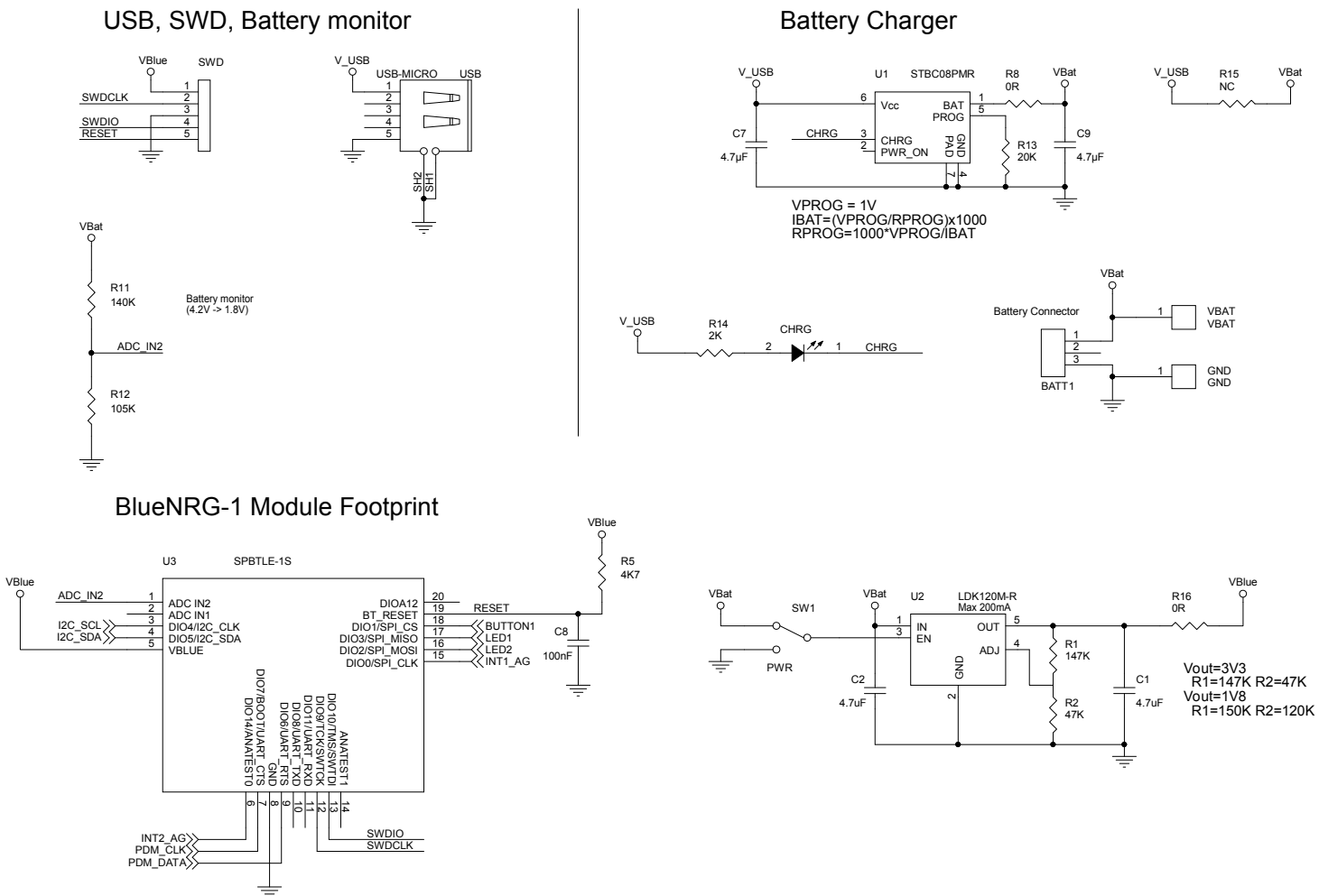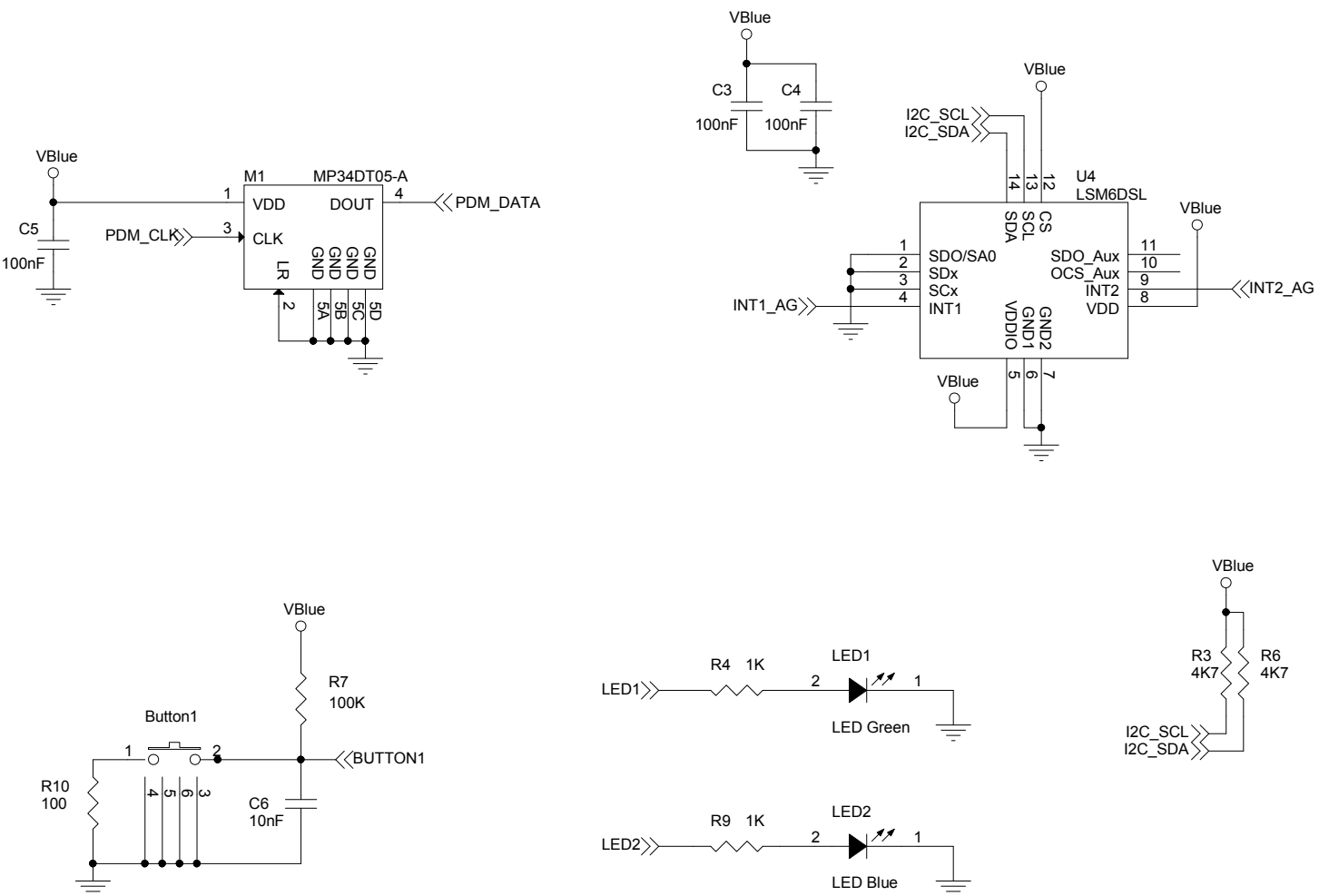| Summary table	
BlueNRG-1 very low power Bluetooth low energy single mode system-on-chip embedding a high performance	BlueNRG-1
STSW-BLUEMIC-1 evaluation software package	STSW-BLUEMIC-1
STSW-BLUENRG1-DK software package	STSW-BLUENRG1-DK
MP34DT05-A ultra-compact, low-power, omnidirectional, digital MEMS microphone	MP34DT05-A
LSM6DSL 3-axis accelerometer and gyroscope	LSM6DSL
STEVAL-BLUEMIC-1 evaluation board	STEVAL-BLUEMIC-1

DB3334 - Rev 3 - February 2018
For further information contact your local STMicroelectronics sales office.

www.st.com

1 Schematic diagrams

USB, SWD, Battery monitor

VBlue SWD

SWDCLK — 1
2
3
SWDIO — 4
RESET — 5

V_USB USB-MICRO USB

1
2
3
4
5

SH2 SH1

VBat

R11 140K

Battery monitor (4.2V -> 1.8V)

ADC_IN2

R12 105K

Battery Charger

V_USB U1 STBC08PMR R8 0R VBat

6 Vcc BAT PROG 1
5

C7 CHRG 3 CHRG GND PAD R13 20K C9

4.7µF 2 PWR_ON 7 4 4.7µF

VPROG = 1V
IBAT=(VPROG/RPROG)x1000
RPROG=1000*VPROG/IBAT

V_USB R15 NC VBat

V_USB R14 2K CHRG

2 1 CHRG

VBat

Battery Connector

1 VBAT VBAT

1
2
3

BATT1

1 GND GND

Figure 1. Power and SPBTLE-1S module

BlueNRG-1 Module Footprint

VBlue

R5 4K7

U3 SPBTLE-1S

VBlue

ADC_IN2 — 1 ADC IN2 DIOA12 20 RESET
2 ADC IN1 BT_RESET 19
I2C_SCL — 3 DIO4/I2C_CLK DIO1/SPI_CS 18 BUTTON1
I2C_SDA — 4 DIO5/I2C_SDA DIO3/SPI_MISO 17 LED1
5 VBLUE DIO2/SPI_MOSI 16 LED2
DIO0/SPI_CLK 15 INT1_AG

C8 100nF

DIO7/BOOT/UART_CTS
DIO14/ANATEST0
GND
DIO6/UART_RTS
DIO8/UART_TXD
DIO11/UART_RXD
DIO9/TCK/SWTCK
DIO10/TMS/SWTDI
ANATEST1

6 7 8 9 10 11 12 13 14

INT2_AG
PDM_CLK
PDM_DATA

SWDIO
SWDCLK

VBat SW1 VBat U2 LDK120M-R Max 200mA R16 0R VBlue

1 IN OUT 5
3 EN

PWR ADJ 4 R1 147K

C2 GND C1

4.7uF 2 R2 47K 4.7uF

Vout=3V3
R1=147K R2=47K
Vout=1V8
R1=150K R2=120K

Figure 2. MEMS, button and LEDs

Revision history

Table 1. Document revision history

Date	Version	Changes
18-Jul-2017	1	Initial release.
20-Nov-2017	2	Updated cover page features.
06-Feb-2018	3	Added device summary table in cover page. Update schematic diagrams.