



## SAR Evaluation Report

**Application No.:** SZEM2008007465CR  
**Applicant:** Micro:bit Educational Foundation  
**Address of Applicant:** 12 New Fetter Lane, London EC4A 1JP, United Kingdom  
**Manufacturer:** Micro:bit Educational Foundation  
**Address of Manufacturer:** 12 New Fetter Lane, London EC4A 1JP, United Kingdom  
**Factory:** EMBEST TECHNOLOGY CO., LTD  
**Address of Factory:** Tower B 4/F, Shanshui Building, Nanshan Yungu Innovation Industry Park, Liuxian Ave.No.1183, Nanshan  
**Equipment Under Test (EUT):**  
**EUT Name:** BBC micro:bit  
**Model No.:** V2.0  
**Trade mark:** BBC micro:bit  
**FCC ID:** 2AKFPMB0200  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2020-08-04  
**Date of Test:** 2020-08-04 to 2020-09-03  
**Date of Issue:** 2020-09-04

|                      |              |
|----------------------|--------------|
| <b>Test Result :</b> | <b>Pass*</b> |
|----------------------|--------------|

\* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu

Keny Xu  
EMC Laboratory Manager



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## 2 Version

| Revision Record |         |            |          |          |
|-----------------|---------|------------|----------|----------|
| Version         | Chapter | Date       | Modifier | Remark   |
| 01              |         | 2020-09-04 |          | Original |
|                 |         |            |          |          |
|                 |         |            |          |          |

|                          |  |                                                                                     |  |  |
|--------------------------|--|-------------------------------------------------------------------------------------|--|--|
| Authorized for issue by: |  |                                                                                     |  |  |
|                          |  |   |  |  |
|                          |  | Calvin Weng/Project Engineer                                                        |  |  |
|                          |  |  |  |  |
|                          |  | Eric Fu/Reviewer                                                                    |  |  |



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## 4 General Information

### 4.1 General Description of EUT

|                      |                                                  |
|----------------------|--------------------------------------------------|
| Rated voltage:       | DC5V from USB port or DC3V by AAA type battery*2 |
| Battery:             | DC3V by AAA type battery*2                       |
| Operation Frequency: | 2402MHz to 2480MHz                               |
| Bluetooth Version:   | 5.0 LE(1M, 2M)                                   |
| Modulation Type:     | GFSK                                             |
| Number of Channels:  | 40                                               |
| Channel Spacing:     | 2MHz                                             |
| Antenna Type:        | PCB antenna                                      |
| Antenna Gain:        | -0.1dBi                                          |
| FVIN:                | 0254-2020-08-07-c1d9e20                          |
| Software version:    | 0254-2020-08-07-c1d9e20                          |
| Hardware version:    | BBC micro:bit V2.0                               |



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## 4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China  
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

## 4.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

## 4.4 Deviation from Standards

None.

## 4.5 Abnormalities from Standard Conditions

None.

## 4.6 Other Information Requested by the Customer

None.



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## 5 SAR Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

##### 4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

#### 5.1.2 Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

$$\left[ \frac{\text{max. power of channel, including tune-up tolerance, mW}}{(\text{min. test separation distance, mm})} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0$$
 for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where

$f(\text{GHz})$  is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation<sup>17</sup>

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion

#### 5.1.3 EUT RF Exposure

The Max. power (including tune-up tolerance) is 4 dBm on the highest channel 2.48 GHz (\*)  
4.00 dBm logarithmic terms convert to numeric result is nearly 2.51 mW

According to the formula. calculate the test exclusion thresholds:

$$\left[ \frac{\text{max. power of channel, including tune-up tolerance, mW}}{(\text{min. test separation distance, mm})} \right] \cdot \sqrt{f(\text{GHz})}$$

General RF Exposure =  $(2.51 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.48 \text{ GHz}} = 0.79$  (1)

SAR requirement:

$S = 3.0$  (2)

(1)  $<$  (2)

So the SAR report is not required.

(\*) Max. power refer to Report No.:SZEM200800746502

- End of the Report -



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