

RF Exposure Report

Report No.: SA180802E10

FCC ID: JNZCU0018

Test Model: C-U0018

Received Date: Aug. 02, 2018

Test Date: Aug. 07, 2018

Issued Date: Aug. 30, 2018

Applicant: LOGITECH FAR EAST LTD.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA180802E10	Original release.	Aug. 30, 2018

1 Certificate of Conformity

Product: Wireless Transceiver

Brand: Logitech

Test Model: C-U0018

Sample Status: ENGINEERING SAMPLE

Applicant: LOGITECH FAR EAST LTD.

Test Date: Aug. 07, 2018

Standards: FCC Part 2 (Section 2.1093)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : Mary Ko , **Date:** Aug. 30, 2018
Mary Ko / Specialist

Approved by : May Chen , **Date:** Aug. 30, 2018
May Chen / Manager

2 Evaluation Result

Following FCC KDB 447498 D01 “General SAR test exclusion guidance”

The corresponding SAR Exclusion Threshold condition, listed below:

- 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot [\sqrt{f(\text{GHz})}]$$
$$\leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$
 - $f(\text{GHz})$ is the RF channel transmit frequency in GHz.
 - Power and distance are rounded to the nearest mW and mm before calculation.
 - The result is rounded to one decimal place for comparison. The test exclusions are applicable only when the minimum test separation distance is ≤ 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.
- 2) At 100 MHz to 6 GHz and for test separation distances > 50 mm, the SAR test exclusion threshold is determined according to the following:
 - a) [Threshold at 50 mm in step 1) + (test separation distance - 50mm) · ($f(\text{MHz})/150$)] mW, at 100MHz to 1500 MHz
 - b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz
- 3) At frequencies below 100 MHz, the following may be considered for SAR test exclusion.
 - a) The threshold at the corresponding test separation distance at 100 MHz in step 2) is multiplied by $[1 + \log(100/f(\text{MHz}))]$ for test separation distances > 50 mm and < 200 mm.
 - b) The threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$ for test separation distances ≤ 50 mm.
 - c) SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any test results to be acceptable.

3 SAR Test Exclusion Thresholds

BT-LE 1M (BT 4.0) Avg. Power Table

Channel	Frequency (MHz)	Avg. Power	
		(mW)	(dBm)
0	2402	2.472	3.93
19	2440	2.404	3.81
39	2480	2.265	3.55

For BT-LE 1M (BT 4.0) SAR Test Exclusion Thresholds

Frequency (MHz)	Max Avg. Power (dBm)	*Max Time Avg. Power (dBm)	Max Time Avg. Power (mW)	Min. test separation distance (mm)	SAR test exclusion calculation value ^(NOTE 1)	1-g SAR test exclusion thresholds	Result
2402 ~ 2480	3.93	-1.05	0.785	5	0.2433	3	Pass

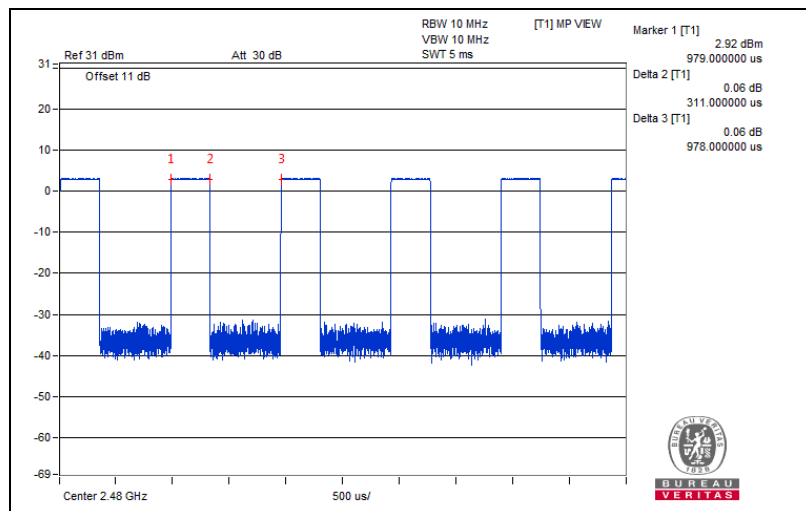
NOTE: 1. Calculate SAR test exclusion thresholds from condition "1" formulas.

2. *Time Avg. Power= Avg. Power+Duty factor

BT-LE 1M (BT 4.0) Duty Cycle of Test Signal

Duty Cycle	Tx on (ms)	Tx total (ms)	Duty Factor (dB)
	0.311	0.978	-4.98

Duty Factor = $10 \cdot \log(\text{Tx on} / \text{Tx total})$



BT-LE 2M (BT 5.0) Avg. Power Table

Channel	Frequency (MHz)	Avg. Power	
		(mW)	(dBm)
1	2404	2.466	3.92
19	2440	2.399	3.80
38	2478	2.27	3.56

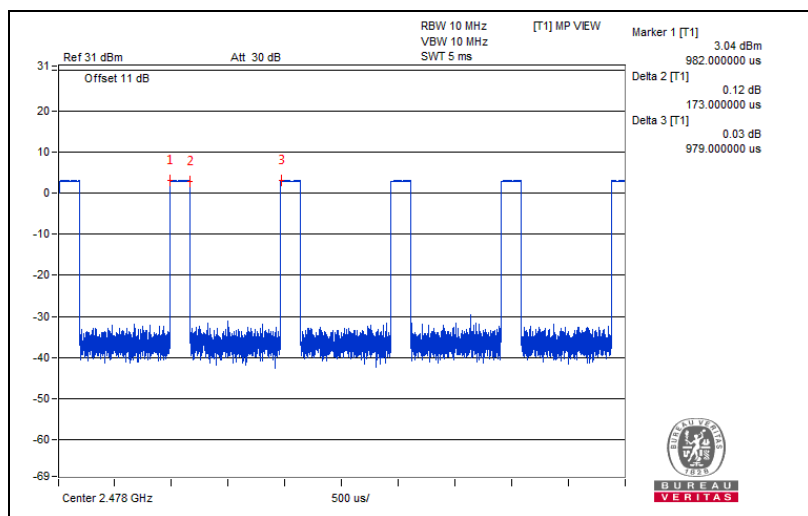
For BT-LE 2M (BT 5.0) SAR Test Exclusion Thresholds

Frequency (MHz)	Max Avg. Power (dBm)	*Max Time Avg. Power (dBm)	Max Time Avg. Power (mW)	Min. test separation distance (mm)	SAR test exclusion calculation value ^(NOTE 1)	1-g SAR test exclusion thresholds	Result
2404 ~ 2478	3.92	-3.61	0.436	5	0.1352	3	Pass

NOTE: 1. Calculate SAR test exclusion thresholds from condition "1" formulas.
2. *Time Avg. Power= Avg. Power+Duty factor

BT-LE 2M (BT 5.0) Duty Cycle of Test Signal

Duty Cycle	Tx on (ms)	Tx total (ms)	Duty Factor (dB)
	0.173	0.979	-7.53
Duty Factor = $10 \cdot \log(\text{Tx on} / \text{Tx total})$			



GFSK Avg. Power Table

Channel	Frequency (MHz)	Avg. Power	
		(mW)	(dBm)
0	2402	1.169	0.68
40	2442	2.393	3.79
79	2481	2.249	3.52

For GFSK SAR Test Exclusion Thresholds

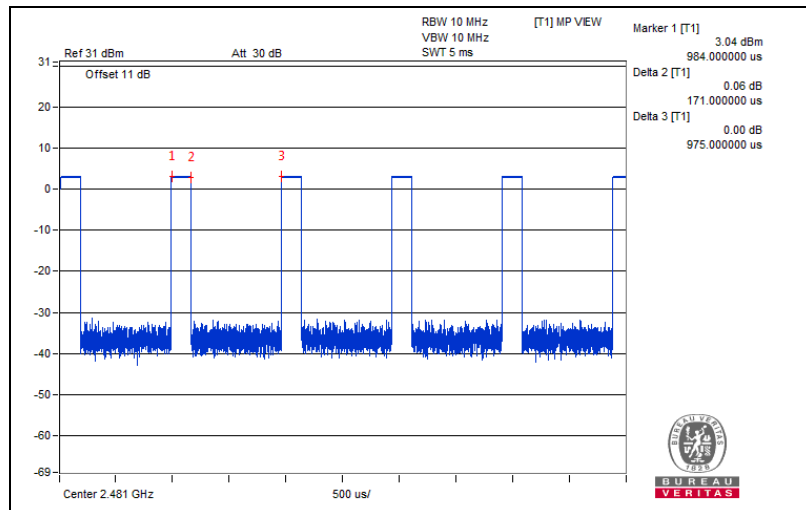
Frequency (MHz)	Max Avg. Power (dBm)	*Max Time Avg. Power (dBm)	Max Time Avg. Power (mW)	Min. test separation distance (mm)	SAR test exclusion calculation value ^(NOTE 1)	1-g SAR test exclusion thresholds	Result
2402 ~ 2481	3.79	-3.77	0.42	5	0.1313	3	Pass

NOTE: 1. Calculate SAR test exclusion thresholds from condition "1" formulas.

2. *Time Avg. Power= Avg. Power+Duty factor

GFSK Duty Cycle of Test Signal

Duty Cycle	Tx on (ms)	Tx total (ms)	Duty Factor (dB)
	0.171	0.975	-7.56
Duty Factor = $10 \cdot \log(\text{Tx on} / \text{Tx total})$			



4 Conclusion

The device of BT-LE and GFSK modulation type can't transmit simultaneously.

Since Source-base time average power is below SAR test exclusion power thresholds, the SAR evaluation is not required.

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