SAR Evaluation Report

Application No.:	SZEM2007006118CR
Applicant:	Jing Mold Electronic Technology (Shen Zhen) Co., Ltd.
Address of Applicant:	Xinqiao, 3rd Industrial Estate Shajing Baoan, ShenZhen, China
Manufacturer:	Lenovo PC HK Limited
Address of Manufacturer:	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, China
Factory:	Jing Mold Electronic Technology (Shen Zhen) Co., Ltd.
Address of Factory:	Xinqiao, 3rd Industrial Estate Shajing Baoan, ShenZhen, China
Equipment Under Test (EUT):	
EUT Name:	Folio BT Keyboard
Model No.:	KB-X0256
Trade mark:	Lenovo
FCC ID:	FPWKB-X0256
Standards:	47 CFR Part 1.1307 47 CFR Part 2.1093 KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2020-07-07
Date of Test:	2020-08-07 to 2020-08-08
Date of Issue:	2020-08-13
Test Result :	**PASS***

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

Keny Xu
EMC Laboratory Manager

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2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2020-08-13		Original

Authorized for issue by:				
				
		Peter Geng /Project Engineer		
				
		Eric Fu /Reviewer		

3 Contents

4 General Information

4.1 General Description of EUT

Power Supply:	DC 3.7V rechargeable battery which charged from Type-C port or Micro-USB port
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	4.2
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	Integral antenna
Antenna Gain:	-0.67dBi

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.

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 ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

f(GHz) is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation[17]

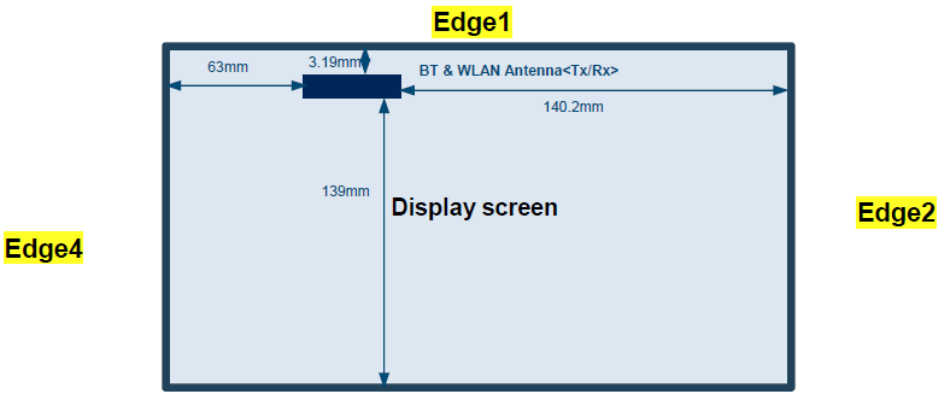
The result is rounded to one decimal place for comparison

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

5.1.3 EUT RF Exposure

This deivce will be using with the following Pads with FCC IDs as below:
O57TBX505F, O57TBX606F, O57TBX306F, O57TBX306FA

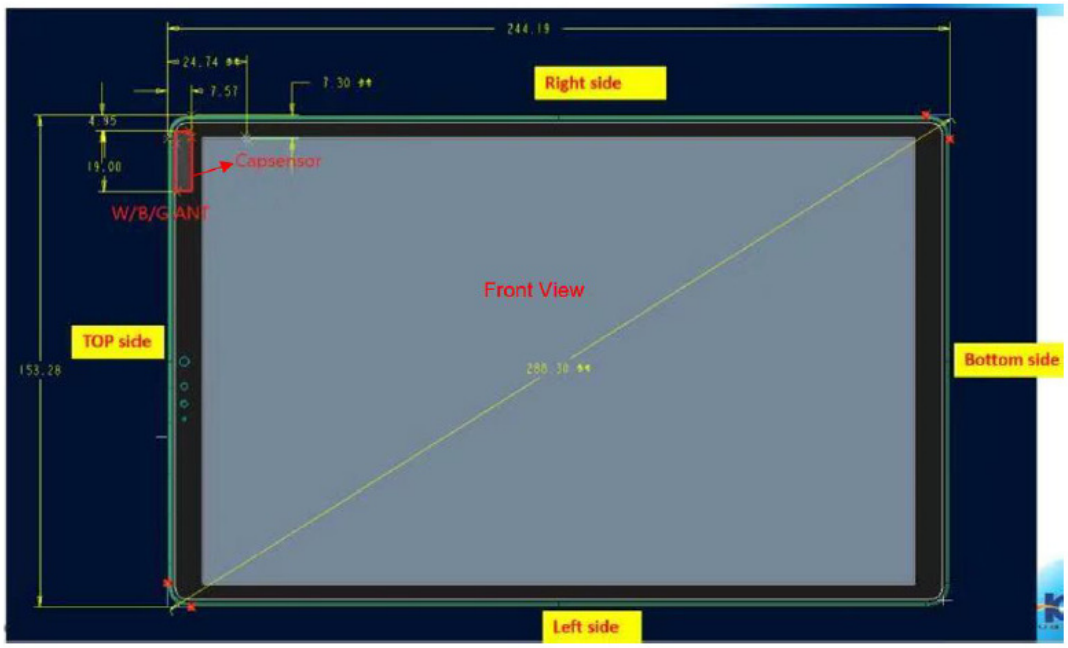
For O57TBX505F, antenna location



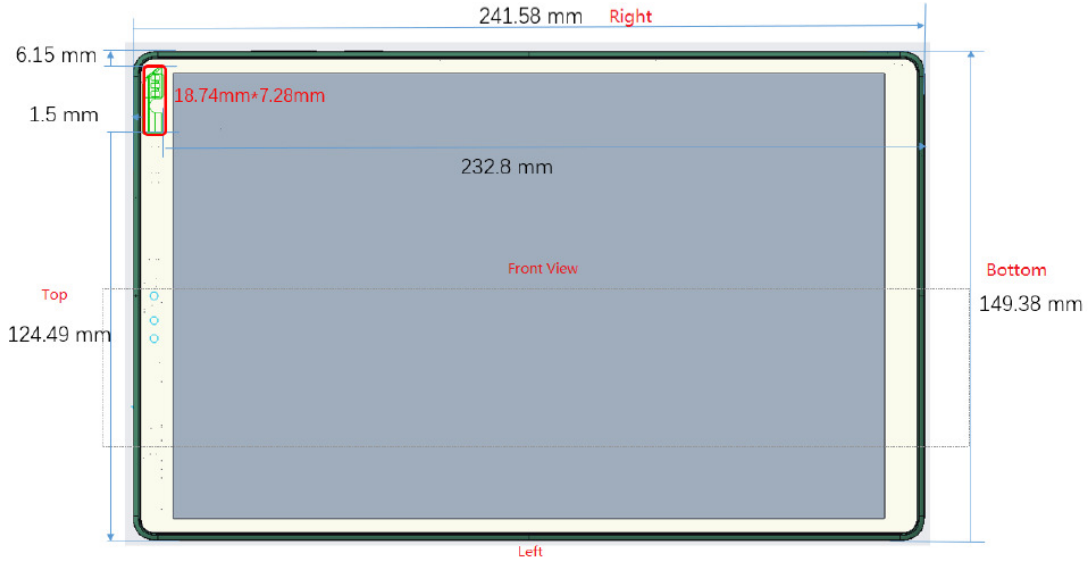
Front View

Length: 243.2mm
Width: 169.1mm

For O57TBX606F, antenna location



For O57TBX306FA(same with O57TBX306F), antenna location



Considered the all antenna location above, the antenna of O57TBX306FA will be possibily closer to the body of the user. I will evaluate the RF exposure based on the O57TBX306FA.

Considering the different situation during the normal working, the closest distance between the antenna of Pad and the body is round 10cm and this value will be used for the RF evaluation.

The Pad just has only one antenna, so we will consider the simultaneous transmission for Bluetooth of Keyboard and 5G wifi for the Pad. The Maximum conducted power for the Pad is 9.5dBm and the maximum conducted power for Keyboard is -5.52dBm.

For the Pad,

The Max. power (including tune-up tolerance) is 9.5 dBm on the lowest channel 2.48 GHz (*)
9.50 dBm logarithmic terms convert to numeric result is nearly 8.91 mW
According to the formula. calculate the test exclusion thresholds:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)]

$$General\ RF\ Exposure = (8.91\ mW\ /15\ mm) \times \sqrt{2.48\ GHz} = 2.81 \quad (1)$$

SAR requirement:

$$S = 3.0 \quad (2)$$

(1) < (2)
So the SAR report is not required.

(*) Max. power refer to Report No.:SZEM200700611801

For the Keyboard:

The Max. power (including tune-up tolerance) is -5.52 dBm on the lowest channel 2.402 GHz (*)
-5.52 dBm logarithmic terms convert to numeric result is nearly 0.28 mW
According to the formula. calculate the test exclusion thresholds:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [vf(GHz)]

$$General\ RF\ Exposure = (0.28\ mW / 5\ mm) \times \sqrt{2.402\ GHz} = 0.09 \quad (1)$$

SAR requirement:

$$S = 3.0 \quad (2)$$

(1) < (2)
So the SAR report is not required.

(*) Max. power refer to Report No.:SZEM200700611801

When simultaneous transmissions,
2.81+0.09=2.9<3.0
So no Sar is required.

- End of the Report -

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