

RF Exposure Report

Report No.: SA170619E02

FCC ID: 2ACTO-APX530

Test Model: APX 530

Received Date: June 22, 2017

Test Date: July 06, 2017

Issued Date: Sep. 06, 2017

Applicant: Sophos Ltd

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Release Control Record

Issue No.	Description	Date Issued
SA170619E02	Original release.	Sep. 06, 2017

1 Certificate of Conformity

Product: Sophos Access Point

Brand: SOPHOS

Test Model: APX 530

Sample Status: ENGINEERING SAMPLE

Applicant: Sophos Ltd

Test Date: July 06, 2017

Standards: FCC Part 2 (Section 2.1091)

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 : Wendy Wu , **Date:** Sep. 06, 2017
Wendy Wu / Specialist

Approved by : May Chen , **Date:** Sep. 06, 2017
May Chen / Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 35cm away from the body of the user.
So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Radio 1								
2.4GHz								
Antenna No.	Transmitter Circuit	Brand	Model No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	*Cable Length
1	Chain (0)	NA	NA	4.71	2.4~2.4835	PIFA	i-pex(MHF)	48
2	Chain (1)	NA	NA	3.54	2.4~2.4835	PIFA	i-pex(MHF)	138
3	Chain (2)	NA	NA	4.6	2.4~2.4835	PIFA	i-pex(MHF)	145
Radio 2								
5GHz								
Antenna No.	Transmitter Circuit	Brand	Model No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	*Cable Length
1	Chain (0)	NA	NA	5.5	5.15~5.85	PIFA	i-pex(MHF)	42
2	Chain (1)	NA	NA	5.76	5.15~5.85	PIFA	i-pex(MHF)	140
3	Chain (2)	NA	NA	5.91	5.15~5.85	PIFA	i-pex(MHF)	145
Radio 3								
Bluetooth								
Antenna No.	Transmitter Circuit	Brand	Model No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	*Cable Length
1	Chain (0)	NA	NA	2.95	2.4~2.4835	PIFA	i-pex(MHF)	74

Note: For 1TX/2TX configuration mode, max gain was selected for the final test.

2.5 Calculation Result

For WLAN:

Frequency (MHz)	Max. Tune-Up Power (dBm)	Max. Tune-Up Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	29	794.328	9.07	35	0.41654	1
5180-5240	17	501.187	10.50	35	0.36530	1
5745-5825	29	794.328	10.50	35	0.57897	1

NOTE:

2.4GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 9.07\text{dBi}$

5GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 10.50\text{dBi}$

For Bluetooth:

Frequency (MHz)	Max. Tune-Up Power (dBm)	Max. Tune-Up Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2402-2480	8	6.31	2.95	35	0.00081	1

NOTE: 1. This power includes tune-up tolerance range that specified in APX 530 Tune-Up power table.

Conclusion:

The formula of calculated the MPE is:

$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz = $0.41654 / 1 + 0.57897 / 1 = 0.99551$

Therefore the maximum calculations of above situations are less than the "1" limit.

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