RF Exposure Report

Report No.:	SA170313E12
FCC ID:	2ACTO-APX320
Test Model:	APX 320
Received Date:	Mar. 13, 2017
Test Date:	Apr. 22 to May 04, 2017
Issued Date:	Aug. 14, 2017
Applicant:	Sophos Ltd
Address:	The Pentagon, Abingdon Science Park, Abingdon, OX14 3YP, United Kingdom
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
SA170313E12	Original release.	Aug. 14, 2017

1 Certificate of Conformity

Product:	Sophos Access Point
Brand:	SOPHOS
Test Model:	APX 320
Sample Status:	ENGINEERING SAMPLE
Applicant:	Sophos Ltd
Test Date:	Apr. 22 to May 04, 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 : _____ , **Date:** Aug. 14, 2017

Wendy Wu / Specialist

Approved by : _____ , **Date:** Aug. 14, 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/cm^2

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 30cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Radio 1							
WLAN - 2.4GHz + 5GHz							
Antenna No.	Transmitter Circuit	Brand	Model No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connecter Type
1	Chain (0)	WNC	NA	3.48 6.79	2.4~2.4835 5.47~5.85	PIFA	i-pex(MHF)
2	Chain (1)	WNC	NA	3.74 6.16	2.4~2.4835 5.47~5.85	PIFA	i-pex(MHF)
Radio 2							
WLAN 5GHz							
Antenna No.	Transmitter Circuit	Brand	Model No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connecter Type
1	Chain (0)	WNC	NA	4.87	5.15~5.35	PIFA	i-pex(MHF)
2	Chain (1)	WNC	NA	5.64	5.15~5.35	PIFA	i-pex(MHF)
Radio 3							
Bluetooth - 2.4GHz							
Antenna No.	Transmitter Circuit	Brand	Model No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connecter Type
1	Chain (0)	WNC	NA	1.87	2.4~2.4835	PIFA	i-pex(MHF)

2.5 Calculation Result of Maximum Conducted Power

For WLAN (Radio 1):

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2412-2462	398.107	6.62	30	0.16164	1
5745-5825	794.328	9.49	30	0.62452	1

NOTE:
2.4GHz: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.62dBi
5GHz:
UNII-3: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 9.49dBi

For WLAN (Radio 2):

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
5180-5240	251.189	8.27	30	0.14912	1

NOTE:
UNII-1: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 8.27dBi

For Bluetooth (Radio 3):

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2402-2480	5.012	1.87	30	0.00068	1

NOTE: 1. This power include tune-up tolerance range that specified in APX 320 Tune Up power table.

Conclusion:
The formula of calculated the MPE is:
CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1
CPD = Calculation power density
LPD = Limit of power density

WLAN 2.4GHz <Radio 1> + WLAN 5GHz (UNII-1) <Radio 2> + Bluetooth <Radio 3> = 0.16164 / 1 + 0.14912 / 1 + 0.00068 / 1 = 0.31144

WLAN 5GHz (UNII-3) <Radio 1> + WLAN 5GHz (UNII-1) <Radio 2> + Bluetooth <Radio 3> = 0.62452 / 1 + 0.14912 / 1 + 0.00068 / 1 = 0.77432

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

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