RF Exposure Report

Report No.:	SA191104C18
FCC ID:	2ACTO-APX320X
Test Model:	APX 320X
Received Date:	Nov. 04, 2019
Test Date:	Dec. 12, 2019 ~ Jan. 13, 2020
Issued Date:	Apr. 01, 2020
Applicant:	Sophos Ltd
Address:	The Pentagon, Abingdon Science Park, Abingdon OX14 3YP, United Kingdom Of Great Britain And Northern Ireland
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
SA191104C18	Original release	Apr. 01, 2020

1 Certificate of Conformity

Product:	Sophos Access Point
Brand:	Sophos
Test Model:	APX 320X
Sample Status:	Engineering sample
Applicant:	Sophos Ltd
Test Date:	Dec. 12, 2019 ~ Jan. 13, 2020
Standards:	FCC Part 2 (Section 2.1093) IEEE C95.1-1992
References Test Guidance:	KDB 447498 D01 General RF Exposure Guidance v06

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 RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen , **Date:** Apr. 01, 2020

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** Apr. 01, 2020

Bruce Chen / Senior Project Engineer

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 28cm away from the body of the user. So, this device is classified as Mobile Device.

3 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
Dipole antenna					
CDD Mode					
WLAN 2412~2462	27.60	6.21	28	0.244	1
WLAN 5180~5240	21.47	8.11	28	0.092	1
WLAN 5260~5320	23.44	8.01	28	0.142	1
WLAN 5500~5700	22.64	8.71	28	0.139	1
WLAN 5745~5825	22.98	9.01	28	0.160	1
Beamforming Mode					
WLAN 2412~2462	26.51	6.21	28	0.190	1
WLAN 5180~5240	18.43	8.11	28	0.046	1
WLAN 5260~5320	21.94	8.01	28	0.100	1
WLAN 5500~5700	21.16	8.71	28	0.099	1
WLAN 5745~5825	22.98	9.01	28	0.160	1
BT LE 2402~2480	8.45	5.2	28	0.002	1
Directional antenna					
CDD Mode					
WLAN 2412~2462	23.96	15.01	28	0.801	1
WLAN 5180~5240	8.42	13.56	28	0.016	1
WLAN 5260~5320	17.12	14.21	28	0.138	1
WLAN 5500~5700	16.92	14.51	28	0.141	1
WLAN 5745~5825	22.79	14.51	28	0.545	1
Beamforming Mode					
WLAN 2412~2462	20.96	15.01	28	0.401	1
WLAN 5180~5240	5.37	13.56	28	0.008	1
WLAN 5260~5320	14.12	14.21	28	0.069	1
WLAN 5500~5700	13.92	14.51	28	0.071	1
WLAN 5745~5825	19.79	14.51	28	0.273	1
BT LE 2402~2480	8.45	5.2	28	0.002	1
Sector antenna					
CDD Mode					
WLAN 2412~2462	23.96	14.41	28	0.697	1
WLAN 5180~5240	8.42	15.58	28	0.025	1
WLAN 5260~5320	17.12	15.71	28	0.195	1
WLAN 5500~5700	16.92	16.01	28	0.199	1
WLAN 5745~5825	22.79	16.11	28	0.788	1
Beamforming Mode					
WLAN 2412~2462	20.96	14.41	28	0.350	1
WLAN 5180~5240	5.37	15.58	28	0.013	1
WLAN 5260~5320	14.12	15.71	28	0.098	1
WLAN 5500~5700	13.92	16.01	28	0.100	1
WLAN 5745~5825	19.79	16.11	28	0.395	1
BT LE 2402~2480	8.45	5.2	28	0.002	1

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

WLAN 2.4GHz:
Dipole antenna: Directional gain = 3.20dBi +10log(2) = 6.21dBi
Directional antenna: Directional gain = 12dBi +10log(2) = 15.01dBi
Sector antenna: Directional gain = 11.4dBi +10log(2) = 14.41dBi

WLAN 5.0GHz:
Dipole antenna:
For 5180~5240MHz: Directional Gain = 5.1dBi+10log(2) = 8.11dBi
For 5260~5320MHz: Directional Gain = 5.0dBi+10log(2) = 8.01dBi
For 5500~5700MHz: Directional Gain = 5.7dBi+10log(2) = 8.71dBi
For 5745~5825MHz: Directional Gain = 6.0dBi+10log(2) = 9.01dBi

Directional antenna:
For 5180~5240MHz: Directional Gain = 10.55dBi+10log(2) = 13.56dBi
For 5260~5320MHz: Directional Gain = 11.2dBi+10log(2) = 14.21dBi
For 5500~5700MHz: Directional Gain = 11.5dBi+10log(2) = 14.51dBi
For 5745~5825MHz: Directional Gain = 11.5dBi+10log(2) = 14.51dBi

Sector antenna:
For 5180~5240MHz: Directional Gain = 12.57dBi+10log(2) = 15.58dBi
For 5260~5320MHz: Directional Gain = 12.7dBi+10log(2) = 15.71dBi
For 5500~5700MHz: Directional Gain = 13.0dBi+10log(2) = 16.01dBi
For 5745~5825MHz: Directional Gain = 13.1dBi+10log(2) = 16.11dBi

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

BT LE+ WLAN 2.4GHz + WLAN 5GHz(5180~5240MHz & 5260~5320MHz)
= 0.002 / 1 + 0.801 / 1 + 0.195 / 1 = 0.998

BT LE+ WLAN 5GHz(5180~5240MHz & 5260~5320MHz) + WLAN 5GHz(5500~5700MHz & 5745~5825MHz)
= 0.002 / 1 + 0.195 / 1 + 0.788 / 1 = 0.985

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

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