

RF Exposure Report

Report No.: SA141227C17A

FCC ID: 2ACTO-AP100C

Test Model: AP 100C

Received Date: Dec. 27, 2014

Test Date: Jan. 23 ~ May 27, 2015

Issued Date: May 27, 2015

Applicant: Sophos Ltd

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Release Control Record

Issue No.	Description	Date Issued
SA141227C17A	Original release.	May 27, 2015

1 Certificate of Conformity

Product: Sophos wireless Access Point AP 100C

Brand: Sophos

Test Model: AP 100C

Sample Status: Engineering sample

Applicant: Sophos Ltd

Test Date: Jan. 23 ~ May 27, 2015

Standards: FCC Part 2 (Section 2.1091)

KDB 447498 D03

IEEE C95.1

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:

May 27, 2015

Pettie Chen / Senior Specialist

Approved by :



Date:

May 27, 2015

Ken Liu / Senior 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				
300-1500	F/1500	30
1500-100,000	1.0	30

F = Frequency in MHz

2.2 MPE Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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 33cm away from the body of the user.

So, this device is classified as **Mobile Device**.

3 Calculation Result Of Maximum Conducted Power

Antenna Type		PIFA		
		P/N	Gain (dBi)	Antenna Connector
2.4GHz Band	Ant. A	RFMTA230900NNAB001	4.65	NA
	Ant. B	RFMTA230900NNAB002	4.36	NA
	Ant. C	RFMTA310819IMAB301	5.77	I-PEX
5.0GHz Band	Ant. D	RFMTA100800NN5B001	6.13	NA
	Ant. E	RFMTA100800NN5B002	5.96	NA
	Ant. F	RFMTA150719IM5B301	6.27	I-PEX

*The EUT doesn't support diversity function in 802.11a, g and 2TX of 802.11n (HT20), 802.11n (HT40), 802.11ac (VHT20), 802.11ac (VHT40) & 802.11ac (VHT80).

*For 802.11b: Antenna C was for the final test.

*For 2TX of 2.4GHz Band: 802.11n (HT20) & 802.11n (HT40) were fixed in Antenna A & B

*For 802.11a was fixed in Antenna D.

*For 2TX of 5.0GHz Band: 802.11n (HT20), 802.11n (HT40), 802.11ac (VHT20), 802.11ac (VHT40) & 802.11ac (VHT80) were fixed in Antenna D & E

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462MHz					
1TX					
802.11b	23.75	5.77	33	0.065	1
802.11g	23.61	4.65	33	0.049	1
2TX					
802.11n(HT20)	25.47	7.52	33	0.145	1
802.11n(HT40)	21.04	7.52	33	0.052	1
3TX					
802.11n(HT20)	27.42	9.72	33	0.378	1
802.11n(HT40)	20.79	9.72	33	0.082	1
5180-5240MHz					
1TX					
802.11a	23.32	6.13	33	0.064	1
2TX					
802.11n(HT20)	26.09	9.06	33	0.239	1
802.11n(HT40)	26.57	9.06	33	0.267	1
802.11ac(VHT20)	26.18	9.06	33	0.244	1
802.11ac(VHT40)	26.70	9.06	33	0.275	1
802.11ac(VHT80)	19.16	9.06	33	0.049	1
3TX					
802.11n(HT20)	25.87	10.89	33	0.347	1
802.11n(HT40)	28.11	10.89	33	0.580	1
802.11ac(VHT20)	25.77	10.89	33	0.339	1
802.11ac(VHT40)	28.07	10.89	33	0.575	1
802.11ac(VHT80)	19.85	10.89	33	0.087	1
5260-5320MHz					
1TX					
802.11a	23.77	6.13	33	0.071	1
2TX					
802.11n(HT20)	23.65	9.06	33	0.136	1
802.11n(HT40)	23.02	9.06	33	0.118	1
802.11ac(VHT20)	23.60	9.06	33	0.135	1
802.11ac(VHT40)	23.02	9.06	33	0.118	1
802.11ac(VHT80)	21.11	9.06	33	0.076	1
3TX					
802.11n(HT20)	20.07	10.89	33	0.091	1
802.11n(HT40)	22.99	10.89	33	0.179	1
802.11ac(VHT20)	19.93	10.89	33	0.088	1
802.11ac(VHT40)	22.93	10.89	33	0.176	1
802.11ac(VHT80)	19.21	10.89	33	0.075	1

5500-5700MHz

1TX

802.11a	21.19	6.13	33	0.039	1
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2TX

802.11n(HT20)	23.72	9.06	33	0.139	1
802.11n(HT40)	23.31	9.06	33	0.126	1
802.11ac(VHT20)	23.80	9.06	33	0.141	1
802.11ac(VHT40)	23.33	9.06	33	0.127	1
802.11ac(VHT80)	18.85	9.06	33	0.045	1

3TX

802.11n(HT20)	20.08	10.89	33	0.091	1
802.11n(HT40)	22.82	10.89	33	0.172	1
802.11ac(VHT20)	20.11	10.89	33	0.092	1
802.11ac(VHT40)	22.88	10.89	33	0.174	1
802.11ac(VHT80)	18.23	10.89	33	0.060	1

5745-5825MHz

1TX

802.11a	18.82	6.13	33	0.023	1
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2TX

802.11n(HT20)	18.30	9.06	33	0.040	1
802.11n(HT40)	19.91	9.06	33	0.058	1
802.11ac(VHT20)	18.24	9.06	33	0.039	1
802.11ac(VHT40)	19.82	9.06	33	0.056	1
802.11ac(VHT80)	18.24	9.06	33	0.039	1

3TX

802.11n(HT20)	19.47	10.89	33	0.079	1
802.11n(HT40)	20.81	10.89	33	0.108	1
802.11ac(VHT20)	19.54	10.89	33	0.081	1
802.11ac(VHT40)	20.75	10.89	33	0.107	1
802.11ac(VHT80)	19.35	10.89	33	0.077	1

NOTE:

2.4GHz:

2TX: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 7.52 \text{ dBi}$

3TX: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/3] = 9.72 \text{ dBi}$

5.0GHz:

2TX: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 9.06 \text{ dBi}$

3TX: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/3] = 10.89 \text{ dBi}$

CONCLUSION:

Both of the WLAN 2.4G & WLAN 5G can transmit simultaneously, the formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

$WLAN 2.4G + WLAN 5.0G = 0.378 + 0.580 = 0.958$

Therefore, the maximum calculation of this situation is 0.958, which is less than the "1" limit.

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