



FCC RF Exposure Result

Applicant : AOPEN Inc.
Address : 5F., No.15, Ln. 128, Sinhu 1st Rd., Neihu District,
Taipei City 114, Taiwan(R.O.C.)
Equipment : AOPEN Chromebox Mini Commercial
Model No. : ME4100
Trade Name : AOPEN
FCC ID : YEW-ME4100CM389


I HEREBY CERTIFY THAT :

The sample was received on Feb. 24, 2017 and the testing was carried out on Feb. 24, 2017 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:


Mark Liao
Assistant Manager

Tested by:


Spree Yei
Engineer

Laboratory Accreditation:

Cerpass Technology Corporation Test Laboratory





Radio Frequency Exposure

Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in FCC Part 2 (Section 2.1091)

KDB 447498

EUT Specification

EUT	AOPEN Chromebox Mini Commercial
Frequency band (Operating)	<input checked="" type="checkbox"/> WLAN: 2412MHz ~ 2462MHz <input checked="" type="checkbox"/> WLAN: 5150MHz ~ 5250MHz <input checked="" type="checkbox"/> WLAN: 5250MHz ~ 5350MHz <input checked="" type="checkbox"/> WLAN: 5470MHz ~ 5725MHz <input checked="" type="checkbox"/> WLAN: 5725MHz ~ 5850MHz <input checked="" type="checkbox"/> Bluetooth: 2402MHz ~ 2480MHz
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation)
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input checked="" type="checkbox"/> Tx/Rx diversity
Max. output power	Band: 2412MHz ~ 2462MHz 802.11b: 18.51dBm (70.90mW) 802.11g: 27.95dBm (624.06mW) 802.11n HT20: 27.16dBm (520.48mW) 802.11n HT40: 24.46dBm (279.29mW) Band: 2402MHz ~ 2480MHz GFSK: 4.16dBm (2.606mW) $\pi/4$ -DQPSK: 7.25dBm (5.309mW) 8DPSK: 7.60dBm (5.754mW) GFSK(BLE): 8.33dBm (6.808mW) Band: 5150MHz ~ 5250MHz 802.11a: 14.95dBm (31.23mW) 802.11an HT20: 17.22dBm (52.73mW) 802.11an HT40: 16.06dBm (40.33mW) 802.11ac VHT20: 17.28dBm (53.42mW) 802.11ac VHT40: 16.11dBm (40.88mW) 802.11ac VHT80: 11.50dBm (14.12mW) Band: 5250MHz ~ 5350MHz 802.11a: 18.38dBm (68.88mW) 802.11an HT20: 18.27dBm (67.15mW)



	<p>802.11an HT40: 17.06dBm (50.77mW) 802.11ac VHT20: 18.32dBm (67.85mW) 802.11ac VHT40: 17.15dBm (51.83mW) 802.11ac VHT80: 9.77dBm (9.49mW)</p> <p>Band: 5470MHz ~ 5725MHz 802.11a: 17.69dBm (58.76mW) 802.11an HT20: 17.63dBm (57.92mW) 802.11an HT40: 16.96dBm (49.70mW) 802.11ac VHT20: 17.69dBm (58.68mW) 802.11ac VHT40: 17.04dBm (50.57mW) 802.11ac VHT80: 9.07dBm (8.08mW)</p> <p>Band: 5725MHz ~ 5850MHz 802.11a: 18.08dBm (64.28mW) 802.11an HT20: 18.11dBm (64.65mW) 802.11an HT40: 16.95dBm (49.50mW) 802.11ac VHT20: 18.18dBm (65.77mW) 802.11ac VHT40: 17.05dBm (50.72mW) 802.11ac VHT80: 16.52dBm (44.88mW)</p>
Antenna gain (Max)	<p>Band: 2412MHz ~ 2462MHz Antenna A: 1.92dBi Antenna B: 1.92dBi</p> <p>Band: 2402MHz ~ 2480MHz Bluetooth: 1.92dBi BLE: 1.92dBi</p> <p>Band: 5150MHz ~ 5850MHz Antenna A: 1.92dBi Antenna B: 1.92dBi</p>
Evaluation applied	<p><input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A</p>
Remark: <p>1. The maximum output power is <u>27.95dBm (624.06mW)</u> at <u>2437MHz</u> (with <u>numeric 1.92 antenna gain.</u>) 2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance. 3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.</p>	

**TEST RESULTS**

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

**Maximum Permissible Exposure**

Modulation Mode	Frequency band (MHz)	Max. Conducted output power(dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm ²)	Limit (mW/cm ²)
802.11b	2412-2462	18.51	1.92	20	0.0219	1
802.11g	2412-2462	27.95	1.92	20	0.1932	1
802.11n HT20	2412-2462	27.16	1.92	20	0.1611	1
802.11n HT40	2412-2462	24.46	1.92	20	0.0865	1
GFSK	2402-2480	4.16	1.92	20	0.0008	1
$\pi/4$ -DQPSK	2402-2480	7.25	1.92	20	0.0016	1
8DPSK	2402-2480	7.60	1.92	20	0.0018	1
GFSK(BLE)	2402-2480	8.33	1.92	20	0.0021	1
802.11a	5150-5250	14.95	1.92	20	0.0097	1
802.11a	5250-5350	18.38	1.92	20	0.0213	1
802.11a	5470-5725	17.69	1.92	20	0.0182	1
802.11a	5725-5850	18.08	1.92	20	0.0199	1
802.11an HT20	5150-5250	17.22	1.92	20	0.0163	1
802.11an HT20	5250-5350	18.27	1.92	20	0.0208	1
802.11an HT20	5470-5725	17.63	1.92	20	0.0179	1
802.11an HT20	5725-5850	18.11	1.92	20	0.0200	1
802.11an HT40	5150-5250	16.06	1.92	20	0.0125	1
802.11an HT40	5250-5350	17.06	1.92	20	0.0157	1
802.11an HT40	5470-5725	16.96	1.92	20	0.0154	1
802.11an HT40	5725-5850	16.95	1.92	20	0.0153	1
802.11ac VHT20	5150-5250	17.28	1.92	20	0.0165	1
802.11ac VHT20	5250-5350	18.32	1.92	20	0.0210	1
802.11ac VHT20	5470-5725	17.69	1.92	20	0.0182	1
802.11ac VHT20	5725-5850	18.18	1.92	20	0.0204	1
802.11ac VHT40	5150-5250	16.11	1.92	20	0.0127	1
802.11ac VHT40	5250-5350	17.15	1.92	20	0.0160	1
802.11ac VHT40	5470-5725	17.04	1.92	20	0.0157	1
802.11ac VHT40	5725-5850	17.05	1.92	20	0.0157	1
802.11ac VHT80	5250-5350	11.50	1.92	20	0.0044	1
802.11ac VHT80	5470-5725	9.77	1.92	20	0.0029	1
802.11ac VHT80	5725-5850	9.07	1.92	20	0.0025	1
802.11ac VHT80	5150-5250	16.52	1.92	20	0.0139	1

NOTE:

Total (Chain0+Chain1) , the formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density