A Test Lab Techno Corp.

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MPE Report

Test Report No.	:	1612CS11
Applicant	:	EDIMAX TECHNOLOGY CO., LTD.
Product Type	:	11ac Wireless Dual-Band Selectable USB Adapter
Trade Name	:	EDIMAX
Model Number	:	EW-7822UNC, EW-7822ULC
Date of Received	:	Jul. 27, 2016
Test Period	:	Aug. 04 ~ Aug. 30, 2016
Date of Issued	:	Dec. 05, 2016
Test Specification	:	EN 62311: 2008
		European Council Recommendation 1999/519/EC
		Public to electromagnetic fields (0Hz to 300GHz)
Location of Test Lab.	:	Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
3. The measurement report has to be written approval of A Test Lab Techno Corp. It may only be reproduced or published in full. This report shall not be reproduced except in full, without the written approval of A Test Lab Techno Corp. The test results in the report only apply to the tested sample.

Approved By : Bill Hu (Bill Hu)

Tested By : Mark Duan (Mark Duan)

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Content

1. General Information 3
2. Basis of Calculations.....4
3. Limits.....4
4. Test Results.....5

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1. General Information

Applicant	EDIMAX TECHNOLOGY CO., LTD. No.3,Wu-Chuan 3rd Road,Wu-Ku Industrial Park, New Taipei City, Taiwan				
Manufacturer	EDIMAX TECHNOLOGY CO., LTD. No.3,Wu-Chuan 3rd Road,Wu-Ku Industrial Park, New Taipei City, Taiwan				
Product Type	11ac Wireless Dual-Band Selectable USB Adapter				
Trade Name	EDIMAX				
Model Number	EW-7822UNC, EW-7822ULC				
Model Number Different Description	Those model numbers differ from each other in selling region.				
Frequency Range	Band			Operate Frequency (MHz)	
	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz			2412 - 2472	
	IEEE 802.11n 2.4GHz 40MHz			2422 - 2462	
	IEEE 802.11a U-NII Band I			5180 - 5240	
	IEEE 802.11n 5GHz / 802.11ac 20MHz U-NII Band I			5180 - 5240	
	IEEE 802.11n 5GHz / 802.11ac 40MHz U-NII Band I			5190 - 5230	
	IEEE 802.11ac 80MHz U-NII Band I			5210	
Antenna Delivery	IEEE 802.11b / 802.11g: 1*Tx + 1*Rx (SISO ANT-0) IEEE 802.11n 2.4GHz 20MHz/40MHz: 2*Tx + 2*Rx IEEE 802.11a: 1*Tx + 1*Rx (SISO ANT-0) IEEE 802.11n 5GHz 20MHz/40MHz: 2*Tx + 2*Rx IEEE 802.11ac 20MHz/40MHz/80MHz: 2*Tx + 2*Rx				
Antenna information	Antenna	Model	Type	Max. Gain (dBi)	
	ANT-0 (Main)	GY197HT632-003	Monopole Antenna	2.4GHz	1.81
				5GHz	1.71
	ANT-1 (AUX)	GY197HT632-003	Monopole Antenna	2.4GHz	0.36
				5GHz	-0.23

2. Basis of Calculations

S = Power density
P = Power input to the antenna
G = Power gain of the antenna in the direction of interest relative to an isotropic radiator
R = Distance to the center of radiation of the antenna

$$S = \frac{PG}{4\pi R^2}$$

3. Limits

Table 1 – Reference levels for general public exposure to time-varying electric and magnetic fields (unperturbed rms values) - Excerpts

Frequency range	E-field strength V/m	H-field strength V/m	B-field μT	Equivalent plane wave Power density S_{eq} W/m^2
Up to 1 Hz	-	$3.2 * 10^4$	$4 * 10^4$	-
1 Hz - 8 Hz	10000	$3.2 * 10^4 / f^2$	$4 * 10^4 / f^2$	-
8 Hz - 25 Hz	10000	$4000/f$	$5000/f$	-
0.025 kHz - 0.8 kHz	$250/f$	$4/f$	$5/f$	-
0.8 kHz - 3 kHz	$250/f$	5	6.25	-
3 kHz - 150 kHz	87	5	6.25	-
0.15 MHz - 1 MHz	87	$0.73/f^{1/2}$	$0.92/f^{1/2}$	-
1 MHz - 10 MHz	$87/f^{1/2}$	$0.73/f^{1/2}$	$0.92/f^{1/2}$	-
10 MHz - 400 MHz	28	0.073	0.092	2
400 MHz - 2000 MHz	$1.375\ f^{1/2}$	$0.0037\ f^{1/2}$	$0.0046\ f^{1/2}$	$f/200$
2 GHz - 300 GHz	61	0.16	0.20	10
Note: f as indicated in the frequency range column.				

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4. Test Results

Band	Frequency (MHz)	Data Rate (Mbps)	Limit (W/m^2)	Distance [R] (m)	Power [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] with Duty cycle (W)	Power Density [S] (W/m^2)
IEEE 802.11b (ANT-0)	2412	1	10	0.2	16.41	1.81	1.52	1	0.067	0.133
	2442		10	0.2	16.69	1.81	1.52	1	0.071	0.141
	2472		10	0.2	16.70	1.81	1.52	1	0.071	0.141
IEEE 802.11g (ANT-0)	2412	6	10	0.2	16.33	1.81	1.52	1	0.065	0.129
	2442		10	0.2	16.81	1.81	1.52	1	0.073	0.145
	2472		10	0.2	16.60	1.81	1.52	1	0.069	0.137
IEEE 802.11n 2.4GHz, 20MHz (MIMO)	2412	13	10	0.2	16.59	1.81	1.52	1	0.069	0.137
	2442		10	0.2	17.09	1.81	1.52	1	0.078	0.155
	2472		10	0.2	16.96	1.81	1.52	1	0.075	0.149
IEEE 802.11n 2.4GHz, 40MHz (MIMO)	2422	27	10	0.2	17.20	1.81	1.52	1	0.080	0.159
	2442		10	0.2	16.59	1.81	1.52	1	0.069	0.137
	2462		10	0.2	16.56	1.81	1.52	1	0.069	0.137
IEEE 802.11a (ANT-0)	5180	6	10	0.2	13.56	1.71	1.48	1	0.034	0.068
	5200		10	0.2	13.17	1.71	1.48	1	0.031	0.062
	5240		10	0.2	13.11	1.71	1.48	1	0.030	0.060
IEEE 802.11ac 20MHz (MIMO)	5180	13	10	0.2	16.94	1.71	1.48	1	0.073	0.145
	5200		10	0.2	16.60	1.71	1.48	1	0.068	0.135
	5240		10	0.2	16.71	1.71	1.48	1	0.069	0.137
IEEE 802.11ac 40MHz (MIMO)	5190	27	10	0.2	16.31	1.71	1.48	1	0.063	0.125
	5230		10	0.2	15.82	1.71	1.48	1	0.057	0.113
IEEE 802.11ac 80MHz (MIMO)	5210	58.6	10	0.2	15.27	1.71	1.48	1	0.050	0.099

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Beamforming on										
Band	Frequency (MHz)	Data Rate (Mbps)	Limit (W/m^2)	Distance [R] (m)	Power [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] with Duty cycle (W)	Power Density [S] (W/m^2)
IEEE 802.11n 2.4GHz, 20MHz (MIMO)	2412	13	10	0.2	16.30	3.38	2.18	1	0.093	0.185
	2442		10	0.2	15.93	3.38	2.18	1	0.085	0.169
	2472		10	0.2	15.89	3.38	2.18	1	0.085	0.169
IEEE 802.11n 2.4GHz, 40MHz (MIMO)	2422	27	10	0.2	16.19	3.38	2.18	1	0.091	0.181
	2442		10	0.2	16.33	3.38	2.18	1	0.094	0.187
	2462		10	0.2	16.01	3.38	2.18	1	0.087	0.173
IEEE 802.11ac 20MHz (MIMO)	5180	13	10	0.2	19.32	2.28	1.69	1	0.145	0.288
	5200		10	0.2	19.29	2.28	1.69	1	0.144	0.286
	5240		10	0.2	19.19	2.28	1.69	1	0.140	0.279
IEEE 802.11ac 40MHz (MIMO)	5190	27	10	0.2	19.46	2.28	1.69	1	0.149	0.296
	5230		10	0.2	19.49	2.28	1.69	1	0.150	0.298
IEEE 802.11ac 80MHz (MIMO)	5210	58.6	10	0.2	19.34	2.28	1.69	1	0.145	0.288

Note:
1. Mobile or fixed location transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.
2. Each band max power which perform MPE of any configurations.
3. The Numeric Gain calculated by 10^(ant. Gain(dBi) /10).
4. The MPE results are evaluated by lowest data rate for WLAN.
5. The device operating IEEE 802.11 a/b/g mode is 1TX (SISO).
6. The device operating IEEE 802.11 n/ac mode is 2TX (MIMO).

Simultaneous Transmitting:

The device has not support simultaneous transmission.