A Test Lab Techno Corp.

Changan Lab：N o. 140-1, Changan Street, Bade District, Taoyuan City 33465, Taiwan (R.O.C)
Tel：886-3-271-0188 / Fax：886-3-271-0190

MPE Report

Test Report No.	：	1602FS14
Applicant	：	Edimax Technology Co Ltd
Product Type	：	AC1750 Ceiling Mount AP
Trade Name	：	EDIMAX
Model Number	：	EW-7679CAP, GAP-679CAP, CAP1750
Date of Received	：	Jan. 04, 2016
Test Period	：	Jan. 15, 2016
Date of Issued	：	Feb. 22, 2016
Test Specification	：	ANSI / IEEE Std.C95.1-1992 / IEEE Std. 1528-2013
		47 CFR § 2.1091
		47 CFR § 1.1310
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.
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Approved By ： Bill Hu (Bill Hu)　　Tested By ： Sky Chou (Sky Chou)

Contents

1. Description of Equipment under Test (EUT)

Applicant	Edimax Technology Co Ltd No.3, Wu-Chuan 3rd Road, Wu-Gu, New Taipei City 24891, Taiwan
Manufacturer	Edimax Technology Co Ltd No.3, Wu-Chuan 3rd Road, Wu-Gu, New Taipei City 24891, Taiwan
Product Type	AC1750 Ceiling Mount AP
Trade Name	EDIMAX
Model Number	EW-7679CAP, GAP-679CAP, CAP1750
Model Number Difference	Those model numbers differ from each other in selling region.
FCC ID	NDD9576791507
Frequency Range	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz : 2412 - 2462 MHz IEEE 802.11n 2.4GHz 40MHz : 2422 - 2452 MHz IEEE 802.11a U-NII Band I : 5180 - 5240 MHz IEEE 802.11a U-NII Band III : 5745 - 5825 MHz IEEE 802.11n 5GHz 20MHz U-NII Band I : 5180 - 5240 MHz IEEE 802.11n 5GHz 20MHz U-NII Band III : 5745 - 5825 MHz IEEE 802.11n 5GHz 40MHz U-NII Band I : 5190 - 5230 MHz IEEE 802.11n 5GHz 40MHz U-NII Band III : 5755 - 5795 MHz IEEE 802.11ac 20MHz U-NII Band I : 5180 - 5240 MHz IEEE 802.11ac 20MHz U-NII Band III : 5745 - 5825 MHz IEEE 802.11ac 40MHz U-NII Band I : 5190 - 5230 MHz IEEE 802.11ac 40MHz U-NII Band III : 5755 - 5795 MHz IEEE 802.11ac 80MHz U-NII Band I : 5210 MHz IEEE 802.11ac 80MHz U-NII Band III : 5775 MHz
Transmit Power (conducted power)	IEEE 802.11b : 0.343 W 25.35 dBm IEEE 802.11g : 0.291 W 24.64 dBm IEEE 802.11n 2.4GHz 20MHz : 0.337 W 25.27 dBm IEEE 802.11n 2.4GHz 40MHz : 0.193 W 22.86 dBm IEEE 802.11a U-NII Band I : 0.109 W 20.36 dBm IEEE 802.11a U-NII Band III : 0.229 W 23.60 dBm IEEE 802.11ac 20MHz U-NII Band I : 0.249 W 23.97 dBm IEEE 802.11ac 20MHz U-NII Band III : 0.865 W 29.37 dBm IEEE 802.11ac 40MHz U-NII Band I : 0.400 W 26.02 dBm IEEE 802.11ac 40MHz U-NII Band III : 0.223 W 23.49 dBm IEEE 802.11ac 80MHz U-NII Band I : 0.037 W 15.73 dBm IEEE 802.11ac 80MHz U-NII Band III : 0.052 W 17.16 dBm

Antenna used	ANT Port		Model Name	Antenna Type	Antenna Gain
	2.4GHz	ANT-0	RFMTA190800NNAB001	PIFA Antenna	4.47 dBi
		ANT-1	RFMTA270819IMAB701		3.21 dBi
		ANT-2	RFMTA260900NNAB001		3.14 dBi
	5GHz	ANT-0	RFMTA130800NN5B001	PIFA Antenna	5.24 dBi
		ANT-1	RFMTA150719IM5B701		6.27 dBi
		ANT-2	RFMTA100800NN5B002		5.96 dBi

Antenna Delivery	IEEE 802.11b / 802.11g: 1TX+1RX IEEE 802.11n 2.4GHz 20MHz/40MHz : 3TX+3RX IEEE 802.11a : 1TX+1RX IEEE 802.11ac 20MHz/40MHz/80MHz : 3TX+3RX
Temperature Range	0 ~ 50°C
RF Evaluation	0.950 mW/cm^2

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 / 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties

2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR § 1.1310 titled “Radiofrequency radiation exposure limits”, generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as “a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter’s radiating structure(s) and the body of the user or nearby persons. ” This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: “IMPORTANT: To meet the FCC’s RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna”. Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a “mobile device” as defined in section § 2.1091 paragraph (b).

Exposure evaluation
$$S = \frac{PG}{4\pi R^2}$$ Where 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.

3. RF Output Power

Band	Date Rate	CH	Frequency (MHz)	Average Conducted power (dBm)			
				ANT-0	ANT-1	ANT-2	ANT-0+1+2
IEEE 802.11b	1M	1	2412.0	24.46	---	---	---
		6	2437.0	25.35	---	---	---
		11	2462.0	23.37	---	---	---
	2M	6	2437.0	24.77	---	---	---
	5.5M	6	2437.0	24.55	---	---	---
	11M	6	2437.0	24.88	---	---	---
IEEE 802.11g	6M	1	2412.0	16.74	---	---	---
		6	2437.0	24.64	---	---	---
		11	2462.0	18.12	---	---	---
	9M	6	2437.0	24.40	---	---	---
	12M	6	2437.0	24.35	---	---	---
	18M	6	2437.0	24.36	---	---	---
	24M	6	2437.0	24.48	---	---	---
	36M	6	2437.0	24.38	---	---	---
	48M	6	2437.0	24.53	---	---	---
	54M	6	2437.0	24.55	---	---	---
IEEE 802.11n 2.4GHz 20MHz	19.5M	1	2412.0	15.41	17.49	17.62	21.72
		6	2437.0	19.16	21.07	21.01	25.27
		11	2462.0	15.90	17.27	17.06	21.55
	39M	6	2437.0	19.09	21.03	20.85	25.18
	58.5M	6	2437.0	19.11	20.95	20.90	25.17
	78M	6	2437.0	19.10	20.99	20.83	25.16
	117M	6	2437.0	18.37	21.01	21.00	25.06
	156M	6	2437.0	19.04	20.98	20.98	25.20
	175.5M	6	2437.0	19.01	20.96	20.94	25.17
	195M	6	2437.0	19.08	20.97	20.95	25.19
IEEE 802.11n 2.4GHz 40MHz	40.5M	3	2422.0	13.14	15.01	14.82	19.17
		6	2437.0	16.73	18.61	18.67	22.86
		9	2452.0	12.38	14.88	14.62	18.87
	81M	6	2437.0	16.40	18.22	18.56	22.60
	121.5M	6	2437.0	16.70	18.11	18.58	22.64
	162M	6	2437.0	16.69	18.33	18.52	22.69
	243M	6	2437.0	16.72	17.89	18.64	22.59
	324M	6	2437.0	16.22	17.78	18.19	22.25
	364.5M	6	2437.0	16.05	17.51	17.93	22.01
	135M	6	2437.0	15.89	17.74	18.05	22.10

Band	Date Rate	CH	Frequency (MHz)	Average Conducted power (dBm)			
				ANT-0	ANT-1	ANT-2	ANT-0+1+2
IEEE 802.11a	6M	36	5180.0	15.81	---	---	---
		40	5200.0	19.67	---	---	---
		44	5220.0	19.30	---	---	---
		48	5240.0	20.36	---	---	---
		149	5745.0	20.11	---	---	---
		153	5765.0	23.34	---	---	---
		157	5785.0	23.57	---	---	---
		161	5805.0	23.60	---	---	---
		165	5825.0	22.25	---	---	---
	54M	36	5180.0	15.66	---	---	---
		40	5200.0	19.56	---	---	---
		44	5220.0	19.12	---	---	---
		48	5240.0	20.24	---	---	---
		149	5745.0	19.97	---	---	---
		153	5765.0	23.16	---	---	---
		157	5785.0	23.45	---	---	---
		161	5805.0	23.46	---	---	---
		165	5825.0	22.15	---	---	---
IEEE 802.11ac 20MHz	19.5M	36	5180.0	14.28	17.71	15.51	20.84
		40	5200.0	18.36	20.44	18.45	23.97
		44	5220.0	18.08	19.65	17.97	23.41
		48	5240.0	18.38	19.75	18.43	23.67
		149	5745.0	17.84	19.37	18.29	23.32
		153	5765.0	23.68	25.00	24.81	29.31
		157	5785.0	23.74	25.02	24.92	29.37
		161	5805.0	22.41	25.19	24.81	29.07
		165	5825.0	17.40	18.87	17.82	22.85
	234M	36	5180.0	14.21	17.42	15.27	20.62
		40	5200.0	18.13	20.09	18.16	23.67
		44	5220.0	17.73	19.35	17.67	23.09
		48	5240.0	18.18	19.53	18.22	23.46
		149	5745.0	17.55	19.15	18.04	23.07
		153	5765.0	23.41	24.72	24.58	29.05
		157	5785.0	23.46	24.78	24.66	29.11
		161	5805.0	22.20	24.99	24.56	28.85
		165	5825.0	17.15	18.67	17.58	22.62

Band	DateRate	CH	Frequency (MHz)	Average Conducted power (dBm)			
				ANT-0	ANT-1	ANT-2	ANT-0+1+2
IEEE 802.11ac 40MHz	40.5M	38	5190.0	11.87	15.08	12.51	18.16
		46	5230.0	18.90	22.66	21.40	26.02
		151	5755.0	13.18	15.91	15.47	19.78
		159	5795.0	17.44	20.56	17.33	23.49
	540M	38	5190.0	11.54	14.72	12.12	17.80
		46	5230.0	18.59	22.33	21.07	25.70
		151	5755.0	12.91	15.62	15.25	19.52
		159	5795.0	17.20	20.28	17.13	23.24
IEEE 802.11ac 80MHz	87.9M	42	5210.0	9.90	12.39	10.12	15.73
		155	5775.0	13.00	12.50	11.54	17.16
	1170M	42	5210.0	9.63	12.16	9.84	15.47
		155	5775.0	12.78	12.26	11.33	16.94

4. Test Result

Band	Data Rate	Frequency (MHz)	Limit (mw/cm^2)	Distance (cm) [R]	Max Tune-up power (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] With Duty Cycle (mW) [TP]	Power Density [S] (mw/cm^2)
IEEE 802.11b	1M	2412	1	20	24.60	4.47	2.8	1	807.53	0.161
		2437	1	20	25.50	4.47	2.8	1	993.48	0.198
		2462	1	20	23.50	4.47	2.8	1	626.84	0.125
IEEE 802.11g	6M	2412	1	20	16.90	4.47	2.8	1	137.14	0.027
		2437	1	20	24.80	4.47	2.8	1	845.59	0.168
		2462	1	20	18.30	4.47	2.8	1	189.30	0.038
IEEE 802.11n 2.4GHz 20MHz_MIMO	19.5M	2412	1	20	21.90	4.47	2.8	1	433.67	0.086
		2437	1	20	25.40	4.47	2.8	1	970.86	0.193
		2462	1	20	21.70	4.47	2.8	1	414.15	0.082
IEEE 802.11n 2.4GHz 40MHz_MIMO	40.5M	2422	1	20	19.30	4.47	2.8	1	238.32	0.047
		2437	1	20	23.00	4.47	2.8	1	558.67	0.111
		2452	1	20	19.00	4.47	2.8	1	222.41	0.044
IEEE 802.11a	6M	5180	1	20	16.00	5.24	3.34	1	132.97	0.026
		5200	1	20	19.80	5.24	3.34	1	318.97	0.063
		5220	1	20	19.40	5.24	3.34	1	290.90	0.058
		5240	1	20	20.50	5.24	3.34	1	374.75	0.075
		5745	1	20	20.30	5.24	3.34	1	357.89	0.071
		5765	1	20	23.50	5.24	3.34	1	747.73	0.149
		5785	1	20	23.70	5.24	3.34	1	782.97	0.156
		5805	1	20	23.70	5.24	3.34	1	782.97	0.156
		5825	1	20	22.40	5.24	3.34	1	580.43	0.115
IEEE 802.11ac 20MHz_MIMO	19.5M	5180	1	20	21.00	6.27	4.24	1	533.78	0.106
		5200	1	20	24.10	6.27	4.24	1	1089.85	0.217
		5220	1	20	23.60	6.27	4.24	1	971.33	0.193
		5240	1	20	23.80	6.27	4.24	1	1017.11	0.202
		5745	1	20	23.50	6.27	4.24	1	949.22	0.189
		5765	1	20	29.50	6.27	4.24	1	3778.90	0.752
		5785	1	20	29.50	6.27	4.24	1	3778.90	0.752
		5805	1	20	29.20	6.27	4.24	1	3526.68	0.702
		5825	1	20	23.00	6.27	4.24	1	845.99	0.168

Band	Data Rate	Frequency (MHz)	Limit (mw/cm^2)	Distance (cm) [R]	Max Tune-up power (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] With Duty Cycle (mW) [TP]	Power Density [S] (mw/cm^2)
IEEE 802.11ac 40MHz_MIMO	40.5M	5190	1	20	18.30	6.27	4.24	1	286.66	0.057
		5230	1	20	26.20	6.27	4.24	1	1767.53	0.352
		5755	1	20	19.90	6.27	4.24	1	414.35	0.082
		5795	1	20	23.60	6.27	4.24	1	971.33	0.193
IEEE 802.11ac 80MHz_MIMO	89.7M	5210	1	20	15.90	6.27	4.24	1	164.96	0.033
		5775	1	20	17.30	6.27	4.24	1	227.70	0.045

Note:

1. The Numeric Gain calculated by 10^(ant. Gain(dBi) /10).
2. Each band max power which perform MPE of any configurations.

Simultaneous Transmitting:

Simultaneous MPE =

2.4GHz MPE + 5G MPE = 0.198 + 0.752 = 0.950 (mW)/cm^2 < 1 (mW)/cm^2