



A Test Lab Techno Corp.

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MPE Report

Test Report No.	: 1607FS16
Applicant	: Intel Corporation
Product Type	: Cloud Rest
Trade Name	: Intel
Model Number	: Aero Platform
Date of Received	: Jul. 19, 2016
Test Period	: Jul. 22, 2016
Date of Issued	: Aug. 01, 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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1. Description of Equipment under Test (EUT)

Applicant	Intel Corporation 2200 Mission College Blvd, Santa Clara, California, United States 95054		
Manufacturer	Thunder Software Technology Co., Ltd 4F, Taixiang Building, 1A Longxiang Rd., Haidian District, Beijing 100191, P.R. China		
Product Type	Cloud Rest		
Trade Name	Intel		
Model Number	Aero Platform		
FCC ID	2AB8ZAERO		
Frequency Range	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz : 2412 - 2467 MHz IEEE 802.11n 2.4GHz 40MHz : 2422 - 2457 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		
Antenna information	Type	Max. Gain (dBi)	
	FPC Antenna	2.4GHz	3.89
		5GHz_Band I	4.76
		5GHz_Band III	4.64
Directional Gain	Band	Directional Gain	
	2.4GHz	3.89 dBi (please refer to RF report)	
	5GHz_Band I	4.76 dBi (please refer to RF report)	
	5GHz_Band III	4.64 dBi (please refer to RF report)	
Antenna Delivery	IEEE 802.11b / 802.11g : 1TX + 1RX (ANT-1) IEEE 802.11a: 1TX + 1RX (ANT-0) IEEE 802.11n 2.4GHz 20MHz / 40MHz / ac 20MHz / 40MHz / 80MHz: 2TX + 2RX		
Temperature Range	0 ~ +45°C		
RF Evaluation	0.092 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

The conducted power turn-up tolerance reference manufacturer specification.

Band	Data Rate	CH	Frequency (MHz)	Average Conducted power (dBm)		
				ANT-0	ANT-1	ANT-0+1
IEEE 802.11b	1M	1	2412.0	18.95	19.47	---
		6	2437.0	20.96	21.45	---
		11	2462.0	17.88	18.34	---
		12	2467.0	16.10	16.24	---
	2M	6	2437.0	20.83	21.43	---
	5.5M	6	2437.0	20.91	21.35	---
	11M	6	2437.0	20.79	21.39	---
IEEE 802.11g	6M	1	2412.0	16.36	16.82	---
		6	2437.0	20.86	21.30	---
		11	2462.0	15.91	16.38	---
		12	2467.0	14.22	14.48	---
	9M	6	2437.0	20.68	21.25	---
	12M	6	2437.0	20.66	21.19	---
	18M	6	2437.0	20.55	21.06	---
	24M	6	2437.0	20.64	21.09	---
	36M	6	2437.0	20.55	21.13	---
	48M	6	2437.0	20.63	21.20	---
54M	6	2437.0	20.74	21.22	---	
IEEE 802.11n 2.4GHz 20MHz	13M	1	2412.0	16.61	17.05	19.85
		6	2437.0	19.13	19.70	22.43
		11	2462.0	15.31	15.55	18.44
		12	2467.0	13.78	13.91	16.86
	26M	6	2437.0	19.10	19.68	22.41
	39M	6	2437.0	19.04	19.63	22.36
	52M	6	2437.0	19.02	19.47	22.26
	78M	6	2437.0	18.95	19.51	22.25
	104M	6	2437.0	18.91	19.46	22.20
	117M	6	2437.0	18.99	19.60	22.32
130M	6	2437.0	18.85	19.55	22.22	
IEEE 802.11n 2.4GHz 40MHz	27M	3	2422.0	14.66	15.21	17.95
		6	2437.0	15.45	15.99	18.74
		9	2452.0	12.93	13.24	16.10
		10	2457.0	11.36	11.53	14.46
	54M	6	2437.0	15.43	15.95	18.71
	81M	6	2437.0	15.39	15.91	18.67
	108M	6	2437.0	15.31	15.88	18.61
	162M	6	2437.0	15.28	15.80	18.56
	216M	6	2437.0	15.40	15.82	18.63
	243M	6	2437.0	15.35	15.68	18.53
135M	6	2437.0	15.33	15.72	18.54	



Band	Data Rate	CH	Frequency (MHz)	Average Conducted power (dBm)		
				ANT-0	ANT-1	ANT-0+1
IEEE 802.11a	6M	36	5180.0	15.92	15.72	---
		40	5200.0	16.06	15.86	---
		44	5220.0	16.31	16.13	---
		48	5240.0	16.01	15.84	---
		149	5745.0	16.96	16.72	---
		153	5765.0	19.24	19.01	---
		157	5785.0	19.40	19.17	---
		161	5805.0	19.16	18.95	---
	165	5825.0	18.29	17.93	---	
	54M	36	5180.0	15.87	15.65	---
		40	5200.0	16.03	15.96	---
		44	5220.0	16.26	15.86	---
		48	5240.0	15.99	15.74	---
		149	5745.0	16.92	16.76	---
		153	5765.0	19.20	18.96	---
		157	5785.0	19.34	19.13	---
161		5805.0	19.12	19.05	---	
165	5825.0	18.26	17.92	---		
IEEE 802.11n 5GHz 20MHz	13M	36	5180.0	9.40	9.13	12.28
		40	5200.0	9.45	9.26	12.37
		44	5220.0	9.53	9.29	12.42
		48	5240.0	9.55	9.28	12.43
		149	5745.0	15.81	15.51	18.67
		153	5765.0	18.75	18.61	21.69
		157	5785.0	18.95	18.76	21.87
		161	5805.0	18.79	18.70	21.76
	165	5825.0	17.00	16.91	19.97	
	130M	36	5180.0	9.35	9.10	12.24
		40	5200.0	9.40	9.22	12.32
		44	5220.0	9.51	9.27	12.40
		48	5240.0	9.53	9.24	12.40
		149	5745.0	15.77	15.48	18.64
		153	5765.0	18.70	18.60	21.66
		157	5785.0	18.93	18.72	21.84
161		5805.0	18.78	18.65	21.73	
165	5825.0	16.96	16.89	19.94		



Band	DataRate	CH	Frequency (MHz)	Average Conducted power (dBm)		
				ANT-0	ANT-1	ANT-0+1
IEEE 802.11n 5GHz 40MHz	27M	38	5190.0	10.36	10.29	13.34
		46	5230.0	10.22	10.17	13.21
		151	5755.0	14.94	14.90	17.93
		159	5795.0	17.07	17.02	20.06
	270M	38	5190.0	10.32	10.28	13.31
		46	5230.0	10.18	10.15	13.18
		151	5755.0	14.89	14.88	17.90
		159	5795.0	17.05	17.01	20.04
IEEE 802.11ac 80MHz	58.6M	42	5210.0	10.49	10.15	13.33
		155	5775.0	12.50	12.08	15.31
	780M	42	5210.0	10.43	10.14	13.30
		155	5775.0	12.44	12.05	15.26



4. Test Result

Band	Data Rate	Frequency (MHz)	Limit (mw)	Distance [R] (cm)	Max tune-up Power (upper limit) [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] with Duty cycle [TP] (mW)	Power Density [S] (mw/cm ²)
IEEE 802.11b ANT-1	1M	2412.0	1.000	20	19.60	3.89	2.45	1	223.440	0.044
		2437.0	1.000	20	21.60	3.89	2.45	1	354.130	0.070
		2462.0	1.000	20	18.50	3.89	2.45	1	173.450	0.035
		2467.0	1.000	20	17.00	3.89	2.45	1	122.790	0.024
IEEE 802.11g ANT-1	6M	2412.0	1.000	20	17.00	3.89	2.45	1	122.790	0.024
		2437.0	1.000	20	21.40	3.89	2.45	1	338.190	0.067
		2462.0	1.000	20	16.50	3.89	2.45	1	109.440	0.022
		2467.0	1.000	20	15.00	3.89	2.45	1	77.480	0.015
IEEE 802.11n 2.4GHz 20MHz (CDD)	13M	2412.0	1.000	20	20.00	3.89	2.45	1	245.000	0.049
		2437.0	1.000	20	22.60	3.89	2.45	1	445.830	0.089
		2462.0	1.000	20	18.60	3.89	2.45	1	177.490	0.035
		2467.0	1.000	20	17.00	3.89	2.45	1	122.790	0.024
IEEE 802.11n 2.4GHz 40MHz (CDD)	27M	2422.0	1.000	20	18.10	3.89	2.45	1	158.190	0.031
		2437.0	1.000	20	18.90	3.89	2.45	1	190.180	0.038
		2452.0	1.000	20	16.20	3.89	2.45	1	102.130	0.020
		2457.0	1.000	20	15.00	3.89	2.45	1	77.480	0.015



Band	Data Rate	Frequency (MHz)	Limit (mw)	Distance [R] (cm)	Max tune-up Power (upper limit) [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G]	Duty Cycle	[P] x [G] with Duty cycle [TP] (mW)	Power Density [S] (mw/cm ²)
IEEE 802.11a ANT-0	6M	5180.0	1.000	20	17.00	4.76	2.99	1	149.850	0.030
		5200.0	1.000	20	17.00	4.76	2.99	1	149.850	0.030
		5220.0	1.000	20	17.00	4.76	2.99	1	149.850	0.030
		5240.0	1.000	20	17.00	4.76	2.99	1	149.850	0.030
		5745.0	1.000	20	17.00	4.64	2.91	1	145.850	0.029
		5765.0	1.000	20	20.00	4.64	2.91	1	291.000	0.058
		5785.0	1.000	20	20.00	4.64	2.91	1	291.000	0.058
		5805.0	1.000	20	20.00	4.64	2.91	1	291.000	0.058
		5825.0	1.000	20	20.00	4.64	2.91	1	291.000	0.058
IEEE 802.11n 5GHz 20MHz (CDD)	13M	5180.0	1.000	20	12.00	4.76	2.99	1	47.390	0.009
		5200.0	1.000	20	12.00	4.76	2.99	1	47.390	0.009
		5220.0	1.000	20	12.00	4.76	2.99	1	47.390	0.009
		5240.0	1.000	20	12.00	4.76	2.99	1	47.390	0.009
		5745.0	1.000	20	17.00	4.64	2.91	1	145.850	0.029
		5765.0	1.000	20	22.00	4.64	2.91	1	461.200	0.092
		5785.0	1.000	20	22.00	4.64	2.91	1	461.200	0.092
		5805.0	1.000	20	22.00	4.64	2.91	1	461.200	0.092
		5825.0	1.000	20	19.00	4.64	2.91	1	231.150	0.046
IEEE 802.11n 5GHz 40MHz (CDD)	27M	5190.0	1.000	20	13.00	4.76	2.99	1	59.660	0.012
		5230.0	1.000	20	13.00	4.76	2.99	1	59.660	0.012
		5755.0	1.000	20	17.00	4.64	2.91	1	145.850	0.029
		5795.0	1.000	20	19.00	4.64	2.91	1	231.150	0.046
IEEE 802.11ac 80MHz (CDD)	58.6M	5210.0	1.000	20	13.00	4.76	2.99	1	59.660	0.012
		5775.0	1.000	20	15.00	4.64	2.91	1	92.020	0.018

Note:

1. The Numeric Gain calculated by $10^{(\text{ant. Gain(dBi)} / 10)}$.
2. Each band max power which perform MPE of any configurations.
3. The device operating IEEE 802.11 b/g/a mode is diversity with transmit signals to 1TX.
4. The device operating IEEE 802.11 n/ac mode is(CDD) with transmit signals to 2TX.
5. The device 2.4GHz and 5GHz cannot transmit simultaneously.