



A Test Lab Techno Corp.

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MPE Report

Test Report No.	: 1506FS13
Applicant	: MilDef Crete Inc.
Manufacturer	: MilDef Crete Inc.
Product Type	: Notebook Computer
Trade Name	: MilDef Crete Inc.
Model Number	: RT10
Date of Received	: Apr. 30, 2015
Test Period	: Jun. 05, 2015
Date of Issued	: Jun. 24, 2015
Test Specification	: 47 CFR § 2.1091 47 CFR §1.1310 ANSI / IEEE Std.C95.1-1992
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	MilDef Crete Inc.		
Applicant Address	7F, No. 250, Sec 3, Pei Shen Rd., Shen Keng District, New Taipei City, Taiwan		
Manufacturer	MilDef Crete Inc.		
Manufacturer Address	7F, No. 250, Sec 3, Pei Shen Rd., Shen Keng District, New Taipei City, Taiwan		
Product Type	Notebook Computer		
Trade Name	MilDef Crete Inc.		
Model Number	RT10		
FCC ID	IR5RT10		
Frequency Range	Mode	Frequency Range	
	IEEE 802.11b / IEEE 802.11g	2412 - 2462 MHz	
	IEEE 802.11n (2.4GHz) 20MHz	2412 - 2462 MHz	
	IEEE 802.11n (2.4GHz) 40MHz	2422 - 2452 MHz	
	IEEE 802.11a	5180 - 5240 MHz (Band I) 5745 - 5825 MHz (Band III)	
	IEEE 802.11n (5GHz) 20MHz	5180 - 5240 MHz (Band I) 5745 - 5825 MHz (Band III)	
	IEEE 802.11n (5GHz) 40MHz	5190 - 5230 MHz (Band I) 5755 - 5795 MHz (Band III)	
	Bluetooth BR/EDR, Bluetooth LE	2402 - 2480 MHz	
Transmit Power (conducted power)	IEEE 802.11b :	0.084	W 19.22 dBm
	IEEE 802.11g :	0.037	W 15.68 dBm
	IEEE 802.11n (2.4GHz) 20MHz :	0.060	W 17.78 dBm
	IEEE 802.11n (2.4GHz) 40MHz :	0.036	W 15.53 dBm
	IEEE 802.11a (Band I) :	0.068	W 18.35 dBm
	IEEE 802.11a (Band III) :	0.061	W 17.83 dBm
	IEEE 802.11n (5GHz) 20MHz (Band I) :	0.095	W 19.78 dBm
	IEEE 802.11n (5GHz) 20MHz (Band III) :	0.097	W 19.87 dBm
	IEEE 802.11n (5GHz) 40MHz (Band I) :	0.035	W 15.41 dBm
	IEEE 802.11n (5GHz) 40MHz (Band III) :	0.032	W 15.10 dBm
	Bluetooth BR/EDR :	0.005	W 7.29 dBm
	Bluetooth LE :	0.005	W 7.27 dBm



Antenna Specification	IEEE 802.11b, IEEE 802.11g: -0.36 dBi IEEE 802.11n (2.4GHz) 20MHz / 40MHz: -0.36 dBi IEEE 802.11a, IEEE 802.11n (5GHz) 20MHz / 40MHz Band I: 0.85 dBi IEEE 802.11a, IEEE 802.11n (5GHz) 20MHz / 40MHz Band III: -1.48 dBi Bluetooth BR/EDR, Bluetooth LE: -0.36 dBi
Antenna Designation	PIFA Antenna
RF Evaluation	0.24 W/m 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	Data Rate	CH	Frequency (MHz)	Average Power (dBm)		
				ANT-1	ANT-2	ANT-1+2
IEEE 802.11b	1 M	1	2412.0	---	18.76	---
		6	2437.0	---	19.22	---
		11	2462.0	---	17.59	---
	2 M	6	2437.0	---	18.72	---
	5.5 M	6	2437.0	---	18.79	---
	11 M	6	2437.0	---	19.09	---
IEEE 802.11g	6 M	1	2412.0	---	13.61	---
		6	2437.0	---	15.68	---
		11	2462.0	---	15.12	---
	9 M	6	2437.0	---	15.20	---
	12 M	6	2437.0	---	15.51	---
	18 M	6	2437.0	---	15.28	---
	24 M	6	2437.0	---	15.15	---
	36 M	6	2437.0	---	15.49	---
	48 M	6	2437.0	---	15.35	---
	54 M	6	2437.0	---	15.60	---
IEEE 802.11n 20MHz (2.4 GHz) (MIMO)	13 M	1	2412.0	12.87	12.53	15.71
		6	2437.0	14.74	14.79	17.78
		11	2462.0	13.99	15.39	17.76
	26 M	6	2437.0	14.57	14.24	17.42
	39 M	6	2437.0	14.56	14.26	17.42
	52 M	6	2437.0	14.58	14.47	17.54
	78 M	6	2437.0	14.71	14.67	17.70
	104 M	6	2437.0	14.52	14.66	17.60
	117 M	6	2437.0	14.53	14.52	17.54
	130 M	6	2437.0	14.32	14.38	17.36
IEEE 802.11n 40MHz (2.4 GHz) (MIMO)	27 M	3	2422.0	10.85	10.57	13.72
		6	2437.0	12.49	12.55	15.53
		9	2452.0	12.16	12.35	15.27
	54 M	6	2437.0	12.33	12.53	15.44
	81 M	6	2437.0	12.42	12.37	15.41
	108 M	6	2437.0	12.23	12.40	15.33
	162 M	6	2437.0	12.27	12.38	15.34
	216 M	6	2437.0	12.35	12.39	15.38
	243 M	6	2437.0	11.67	12.16	14.93
	270 M	6	2437.0	11.75	11.72	14.75

Band	Data Rate	CH	Frequency (MHz)	Average Conducted power (dBm)		
				ANT-1	ANT-2	ANT-1+2
IEEE 802.11a	6 M	36	5180.0	---	17.80	---
		40	5200.0	---	18.35	---
		44	5220.0	---	17.52	---
		48	5240.0	---	15.25	---
		149	5745.0	---	17.83	---
		153	5765.0	---	17.75	---
		157	5785.0	---	17.79	---
		161	5805.0	---	17.12	---
		165	5825.0	---	16.65	---
	54 M	36	5180.0	---	17.68	---
		40	5200.0	---	17.77	---
		44	5220.0	---	17.50	---
		48	5240.0	---	15.05	---
		149	5745.0	---	17.14	---
		153	5765.0	---	17.60	---
		157	5785.0	---	17.66	---
		161	5805.0	---	17.05	---
		165	5825.0	---	16.49	---
IEEE 802.11a (5GHz) 20MHz (MIMO)	13 M	36	5180.0	16.25	17.19	19.76
		40	5200.0	16.45	17.07	19.78
		44	5220.0	16.23	16.84	19.56
		48	5240.0	14.55	14.63	17.60
		149	5745.0	16.56	17.06	19.83
		153	5765.0	16.51	17.18	19.87
		157	5785.0	16.19	17.05	19.65
		161	5805.0	15.79	16.31	19.07
		165	5825.0	16.38	16.44	19.42
	130 M	36	5180.0	16.21	17.06	19.67
		40	5200.0	16.38	17.01	19.72
		44	5220.0	16.17	16.52	19.36
		48	5240.0	13.87	14.56	17.24
		149	5745.0	16.49	16.94	19.73
		153	5765.0	16.45	16.78	19.63
		157	5785.0	16.09	16.52	19.32
		161	5805.0	15.72	16.18	18.97
		165	5825.0	16.26	15.92	19.10

Band	Data Rate	CH	Frequency (MHz)	Average Conducted power (dBm)		
				ANT-1	ANT-2	ANT-1+2
IEEE 802.11a (5GHz) 40MHz (MIMO)	27 M	38	5190.0	12.12	12.66	15.41
		46	5230.0	12.00	12.32	15.17
		151	5755.0	11.80	12.36	15.10
		159	5795.0	11.68	11.74	14.72
	270 M	38	5190.0	11.94	12.34	15.15
		46	5230.0	11.61	12.19	14.92
		151	5755.0	11.01	11.74	14.40
		159	5795.0	10.96	11.50	14.25

Band	CH	Frequency (MHz)	Packet Type	Average Power (dBm)
Bluetooth BR GFSK	0	2402	DH1	5.61
			DH3	5.62
			DH5	5.63
	39	2441	DH1	6.61
			DH3	6.62
			DH5	6.64
	78	2480	DH1	7.26
			DH3	7.28
			DH5	7.29
Bluetooth EDR $\pi/4$ -DQPSK	0	2402	DH1	2.68
			DH3	2.70
			DH5	2.73
	39	2441	DH1	4.51
			DH3	4.53
			DH5	4.54
	78	2480	DH1	5.35
			DH3	5.38
			DH5	5.40
Bluetooth EDR 8DPSK	0	2402	DH1	2.70
			DH3	2.72
			DH5	2.74
	39	2441	DH1	4.55
			DH3	4.56
			DH5	4.60
	78	2480	DH1	5.36
			DH3	5.39
			DH5	5.41
Bluetooth LE	0	2402	---	5.60
	19	2440	---	6.55
	39	2480	---	7.27

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] (dBi)	Duty Cycle	[P] x [G] with Duty cycle [TP] (mW)	Power Density [S] (mw)/cm ²
IEEE 802.11b	11M	2412	1	20	19.5	-0.36	0.92	1	82.00	0.016
		2437	1	20	19.5	-0.36	0.92	1	82.00	0.016
		2462	1	20	19.5	-0.36	0.92	1	82.00	0.016
IEEE 802.11g	6M	2412	1	20	14.0	-0.36	0.92	1	23.11	0.005
		2437	1	20	16.0	-0.36	0.92	1	36.63	0.007
		2462	1	20	16.0	-0.36	0.92	1	36.63	0.007
IEEE 802.11n (2.4GHz) 20MHz (MIMO)	13M	2412	1	20	16.0	-0.36	0.92	1	36.63	0.007
		2437	1	20	18.0	-0.36	0.92	1	58.05	0.012
		2462	1	20	18.0	-0.36	0.92	1	58.05	0.012
IEEE 802.11n (2.4GHz) 40MHz (MIMO)	27M	2422	1	20	14.0	-0.36	0.92	1	23.11	0.005
		2437	1	20	16.0	-0.36	0.92	1	36.63	0.007
		2452	1	20	16.0	-0.36	0.92	1	36.63	0.007
IEEE 802.11a	6M	5180	1	20	19.0	0.85	1.22	1	96.91	0.019
		5200	1	20	19.0	0.85	1.22	1	96.91	0.019
		5220	1	20	19.0	0.85	1.22	1	96.91	0.019
		5240	1	20	16.0	0.85	1.22	1	48.57	0.010
		5745	1	20	18.0	-1.48	0.71	1	44.80	0.009
		5765	1	20	18.0	-1.48	0.71	1	44.80	0.009
		5785	1	20	18.0	-1.48	0.71	1	44.80	0.009
		5805	1	20	18.0	-1.48	0.71	1	44.80	0.009
		5825	1	20	18.0	-1.48	0.71	1	44.80	0.009
IEEE 802.11n (5GHz) 20MHz (MIMO)	13M	5180	1	20	20.0	0.85	1.22	1	122.00	0.024
		5200	1	20	20.0	0.85	1.22	1	122.00	0.024
		5220	1	20	20.0	0.85	1.22	1	122.00	0.024
		5240	1	20	18.0	0.85	1.22	1	76.98	0.015
		5745	1	20	20.0	-1.48	0.71	1	71.00	0.014
		5765	1	20	20.0	-1.48	0.71	1	71.00	0.014
		5785	1	20	20.0	-1.48	0.71	1	71.00	0.014
		5805	1	20	20.0	-1.48	0.71	1	71.00	0.014
		5825	1	20	20.0	-1.48	0.71	1	71.00	0.014

Band	Data Rate	Frequency (MHz)	Limit (mw)	Distance [R] (cm)	Max tune-up Power (upper limit) [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G] (dBi)	Duty Cycle	[P] x [G] with Duty cycle [TP] (mW)	Power Density [S] (mw)/cm^2
IEEE 802.11n (5GHz) 40MHz (MIMO)	27M	5190	1	20	16.0	0.85	1.22	1	48.57	0.010
		5230	1	20	16.0	0.85	1.22	1	48.57	0.010
		5755	1	20	16.0	-1.48	0.71	1	28.27	0.006
		5795	1	20	16.0	-1.48	0.71	1	28.27	0.006
Bluetooth BR/EDR	---	2402	1	20	7.5	-0.36	0.92	1	5.17	0.001
		2441	1	20	7.5	-0.36	0.92	1	5.17	0.001
		2480	1	20	7.5	-0.36	0.92	1	5.17	0.001
Bluetooth LE	---	2402	1	20	7.5	-0.36	0.92	1	5.17	0.001
		2440	1	20	7.5	-0.36	0.92	1	5.17	0.001
		2480	1	20	7.5	-0.36	0.92	1	5.17	0.001