



A Test Lab Techno Corp.

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MPE Report



Test Report No.	: 1107FS24
Applicant	: Wyse Technology
Manufacturer	: Intel Corporation
Product Type	: Wireless Module
Trade Name	: WYSE
Model Number	: 62230WL
Dates of Test	: Jul. 19, 2011~ Aug. 22, 2011
Date of Issued	: Aug. 22, 2011
Test Specification	: 47 CFR § 2.1091 47 CFR §1.1310 ANSI / IEEE Std.C95.1-1999
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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Contents

1.	Description of Equipment under Test (EUT)	3
2.	Human Exposure Assessment.....	4
3.	Limits.....	5
3.1	Test Result.....	6



1. Description of Equipment under Test (EUT)

Applicant	Wyse Technology
Applicant Address	3471 North First Street San Jose, CA 95134-1803 United States
Manufacturer	Intel Corporation
Manufacturer Address	100 Center Point Circle, Suite 200 Columbia, SC 29210
Product Type	Wireless Module
Host Trade Name	WYSE
Host Model Number	Zx0
Module Trade Name	WYSE
Module Model Number	62230WL
FCC ID	DYD62230WL
Frequency Range	2412 - 2462 MHz IEEE 802.11b / IEEE 802.11g 2412 - 2462 MHz draft 802.11n Standard-20MHz 2422 - 2452 MHz draft 802.11n Wide-40MHz 5180 - 5825 MHz IEEE 802.11a 5180 - 5825 MHz draft 802.11n Standard-20MHz U-NII Band 5190 - 5795 MHz draft 802.11n Wide-40MHz U-NII Band
Transmit Power (conducted power)	IEEE 802.11b: 0.049 W / 16.9 dBm IEEE 802.11g: 0.038 W / 15.8 dBm draft 802.11n Standard-20MHz: 0.041 W / 16.2 dBm draft 802.11n Wide-40MHz: 0.034 W / 15.3 dBm IEEE 802.11a: 0.046 W / 16.6 dBm draft 802.11n Standard-20MHz U-NII Band: 0.044 W / 16.4 dBm draft 802.11n Wide-40MHz U-NII Band IV: 0.246 W / 23.9 dBm
Antenna Specification	IEEE 802.11b / IEEE 802.11g: 2 dBi draft 802.11n Standard-20MHz / Wide-40MHz: 2 dBi IEEE 802.11a / draft 802.11n Standard-20MHz U-NII Band / draft 802.11n Wide-40MHz U-NII Band: 2dBi
Antenna Designation	Dipole Type
Temperature Range	-30 ~ +70°C

The above equipment was tested by Compliance Certification Services Inc. 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

Equation from page 18 of OET Bulletin 65, Edition 97-01

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

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. Limits

Table 1 – Basic restrictions for general public exposure to time varying electric and magnetic fields for frequency up to 10 GHz - Excerpts

Frequency range	Current density for head and trunk mA/m ² (r.m.s)	Whole body average SAR W/kg	Localised SAR (head and trunk) W/kg	Localised SAR (limbs) W/kg
Up to 1 Hz	8			
1 Hz - 4 Hz	$8/f$			
4 Hz - 1000 Hz	2			
1 kHz – 100 kHz	$f/500$			
100 kHz - 10 MHz	$f/500$	0.08	2	4
10 MHz - 10 GHz		0.08	2	4
Note: f is the frequency in hertz.				

Table 2 – 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 μ T	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.				

3.1 Test Result

Band	Frequency (MHz)	Limit (mw)	Distance (cm) [R]	Power (dBm) [P]	ANT Gain (dBi) [G]	EIRP (W)	Duty Cycle	Power Density [S]
IEEE 802.11b	2412 ~ 2462	1.000	20	16.90	2	0.078	1.000	0.009
draft 802.11n 20MHz_U-NII Band1	5150 ~ 5250	1.000	20	16.50	2	0.071	1.000	0.009
draft 802.11n 20MHz_U-NII Band2	5250 ~ 5350	1.000	20	16.60	2	0.072	1.000	0.009
IEEE 802.11a Band3	5470 ~ 5725	1.000	20	16.50	2	0.071	1.000	0.009
draft 802.11n 40MHz_U-NII Band4	5725 ~ 5825	1.000	20	23.90	2	0.389	1.000	0.047

NOTE: For mobile or fixed location transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.