

FCC PART 15.247
EMI MEASUREMENT AND TEST REPORT

For
MERU NETWORKS

1309 S Mary Suite 220 Sunnyvale CA 94087

FCC ID: RE7-AP200

This Report Concerns: ☒ Class II Permissive Change	Equipment Type: 802.11a/b/g Wireless Access Point
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Report No.: <u>R0501172</u>	
Report Date: <u>2005-02-08</u>	
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TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
TEST FACILITY	3
SYSTEM TEST CONFIGURATION.....	5
JUSTIFICATION	5
EUT EXERCISE SOFTWARE	5
SPECIAL ACCESSORIES	5
SCHEMATICS / BLOCK DIAGRAM	5
EQUIPMENT MODIFICATIONS	5
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL I/O CABLING LIST AND DETAILS	5
POWER SUPPLY INFORMATION.....	5
CONFIGURATION OF TEST SYSTEM	6
TEST SETUP BLOCK DIAGRAM	6
SUMMARY OF TEST RESULTS	7
§1.1307(B)(1) & §2.1093 - RF EXPOSURE.....	8
§15.203 - ANTENNA REQUIREMENT.....	9
STANDARD APPLICABLE	9
§15.205, §15.209(A), §15.407(B)(5), §15.407(B)(6) - SPURIOUS RADIATED EMISSION.....	10
MEASUREMENT UNCERTAINTY	10
EUT SETUP.....	11
SPECTRUM ANALYZER SETUP	11
TEST EQUIPMENT LIST AND DETAILS.....	11
TEST PROCEDURE	12
CORRECTED AMPLITUDE & MARGIN CALCULATION	12
SUMMARY OF TEST RESULTS	12

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The Meru Networks's product, FCC ID: RE7-AP200, model number: AP200 or the "EUT" as referred to in this report is a Transceiver, Wireless Access Point. The EUT is a composite device of DTS and NII. For the DTS part (802.11a/b/g), the frequency range is 2412.00 – 2462.00 MHz (for 802.11b/g), maximum output power is 72.3mW & 5725.00 – 5850.00 MHz (for 802.11a), maximum output power is 19.7mW. For the NII part (802.11a), the frequency range is 5180.00 – 5320.00 MHz, maximum output power is 42.9mW.

** The test data gathered are from production sample, serial number: 041103AP200, provided by the manufacturer.*

Objective

This type approval report is prepared on behalf of Meru Networks in accordance with Part 2, Subpart J, Part 15, Subparts A, C, and E of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules for Radiated Emission.

This is a C2PC report. The difference between the original device and the current device is that the manufacturer added 6 more antenna to the EUT. Here is the antenna list:

1. 2.5 dBi ceiling mount diversity antenna: MCD2400PT36
2. 5.5 dBi omni antenna: MCO24005PT36
3. 4 dBi ceiling mount bi-directional hallway: MHA2400PT
4. 13 dBi patch antenna: MP24013XFPT
5. 8dBi Panel antenna: MP24008XFPT
6. 4dBi Omni antenna: MFB24004CM

Among the 6 antennas, MCD2400PT36, MCO24005PT36, MHA2400PT & MP24013XFPT were tested to represent the worst case.

Related Submittal(s)/Grant(s)

The original device was granted on 2004-12-10. Please refer to BACL test report R0411031.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp.

Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations is attached hereinafter and can also be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

SYSTEM TEST CONFIGURATION

Justification

The host system was configured for testing according to ANSI C63.4-2003.

The EUT was tested in the normal (native) operating mode to represent *worst-case* results during the final qualification test.

EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components in a manner similar to a typical use. The test software, provided by the customer, is started the Windows terminal program under the Windows 98/2000/ME/XP operating system.

Once loaded, set the Tx channel to low, mid and high for testing.

Special Accessories

As shown in following test setup block diagram, all interface cables used for compliance testing are shielded. The host PC and the peripherals featured shielded metal connectors.

Schematics / Block Diagram

Please refer to Appendix A.

Equipment Modifications

No modifications were made to the EUT.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
IBM	Laptop PC	2388	/	None

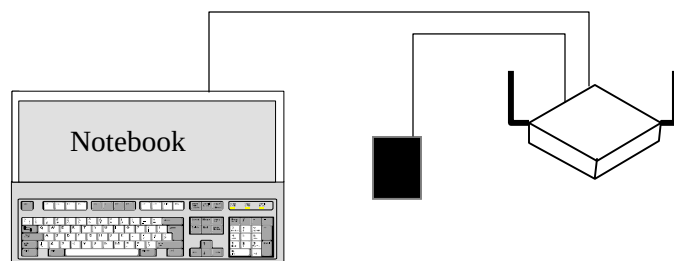
External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
Shield Cable	1.0	RJ45 Port / EUT	RJ45 Port / Laptop PC
Shield Cable	1.0	RJ45 Port / EUT	Power & Data Port / Power – LAN Hub

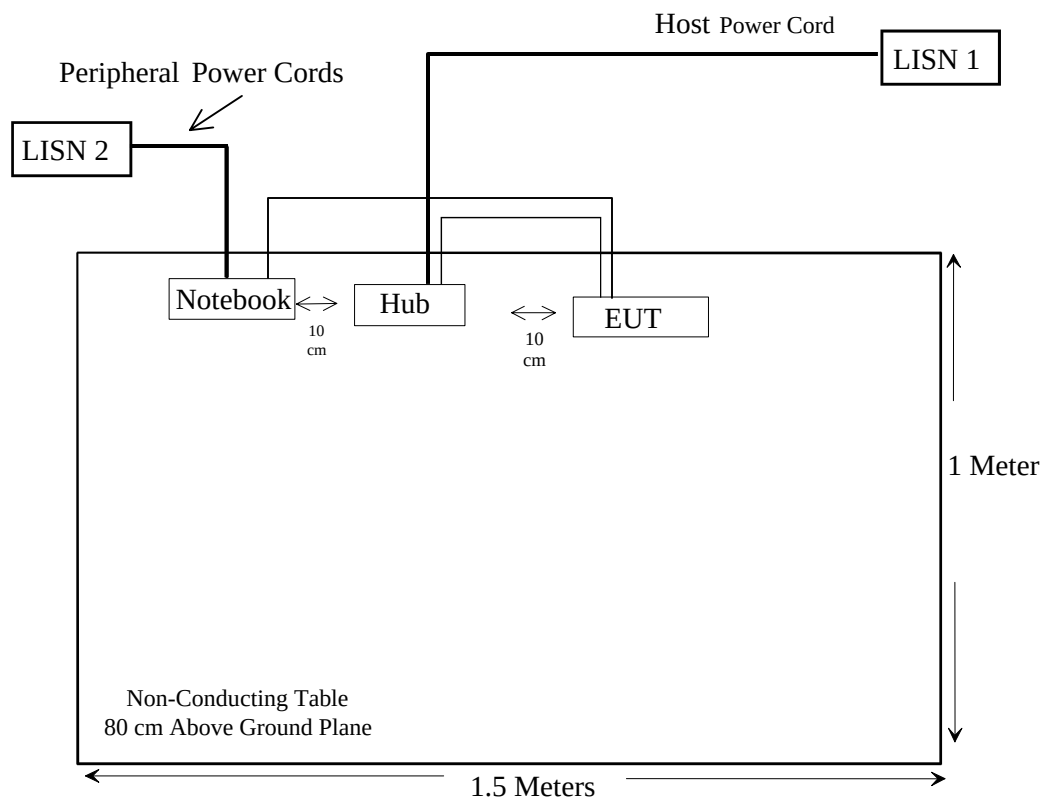
Power Supply Information

Manufacturer	Description	Model	Serial Number	FCC ID
Meru	Power over LAN Hub	PD-6001/AC	None	None

Configuration of Test System



Test Setup Block Diagram



SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: 041103AP200.

FCC RULES	DESCRIPTION OF TEST	RESULT
§2.1093, §15.247(b)(4), §15.407 (f)	RF Exposure Requirement	Compliant
§15.203	Antenna Requirement	Compliant
§ 15.205, §15.209(a), §15.407(b)(5), §15.407(b)(6)	Restricted Bands, Radiated Emission	Compliant
§ 15.207(a)	AC Line Conduction	Unchanged
§15.247(a)(2), §15.407	6 dB Bandwidth & 26 dB Bandwidth	Unchanged
§15.247(b)(3), §15.407(a)(2)	RF Output Power	Unchanged
§ 15.247(c)	100 kHz Bandwidth of Frequency Band Edge	Unchanged
§15.247(d), §15.407(a)(2)	Peak Power Spectral Density	Unchanged
§15.407(a)(6)	Peak Excursion	Unchanged
§15.407(b)	Out of Band Emission	Unchanged
§15.407(c)	Discontinue Transmitting with Absence of Data or Operational Failure	Unchanged
§ 15.407(g)	Frequency Stability	Unchanged

§1.1307(b)(1) & §2.1093 - RF EXPOSURE

According to §15.247(b)(4) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

MPE Prediction

Predication of MPE limit at a given distance

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

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to 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

2412 – 2462 MHz:

Maximum peak output power at antenna input terminal: 18.59 (dBm)

Maximum peak output power at antenna input terminal: 72.28 (mW)

Predication frequency: 2400 (MHz)

Antenna Gain (typical): 13 (dBi)

antenna gain: 19.95 (numeric)

Prediction distance: 11 (cm)

Power density at predication frequency at 11 cm: 0.95 (mW/cm²)

MPE limit for uncontrolled exposure at prediction frequency: 1.0 (mW/cm²)

Test Result

The EUT is of fixed outdoor installation, point -to-point or point-to-multipoint. 1mW/cm2 limit applies. The prediction distance for the 2.4G Hz antenna is 11cm.

§15.203 - ANTENNA REQUIREMENT

Standard Applicable

For intentional device, according to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to § 15.247 (1), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.205, §15.209(a), §15.407(b)(5), §15.407(b)(6) - SPURIOUS RADIATED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

According to §15.205, except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
¹ 0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4
8.37625 – 8.38675	156.7 – 156.9	2655 – 2900	22.01 – 23.12
8.41425 – 8.41475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975 – 12.57725	240 – 285	3345.8 – 3358	36.43 – 36.5
13.36 – 13.41	322 – 335.4	3600 – 4400	(²)

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510MHz

² Above 38.6

Except as provided in paragraph (d) and (e), the filed strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

According to §15.209, the device shall meet radiated emission general requirements.

Except for Class A device, the filed strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (Microvolts/meter)	dB (dBμV/meter)
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with ANSI C63.4-2003. The specification used was the FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle as required.

The host PC system was connected with 120Vac/60Hz power source.

Spectrum Analyzer Setup

According to FCC CFR 47, Section 15.31, the EUT was tested to 40GHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

<u>Frequency Range</u>	<u>RBW</u>	<u>Video B/W</u>
Below 30MHz	10kHz	10kHz
30 – 1000MHz	100kHz	100kHz
Above 1000MHz	1MHz	1MHz

For average measurement, RBW = 1MHz, VBW = 10Hz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Adapter, Quasi-Peak	85650A	3019A05393	6/13/2004
HP	Analyzer, Spectrum, RF	8568B	2601A02165,	7/7/2004
HP	Analyzer, Spectrum, Display	85662A	2542A12015	7/7/2004
HP	Analyzer, Spectrum	8565EC	3946A00131	6/30/2004
Agilent	Amplifier, Pre	8447D	2944A10187	9/23/2004
HP	Amplifier, Pre, microwave	8449B	3147A00400	3/14/2004
EMCO	Antenna, Biconical	3110B	9309-1165	10/11/2004
EMCO	Antenna, Logperiodic	3146	2101	11/8/2004
A. H. Systems	Antenna, Horn, DRG	SAS-200/571	2455-261	8/1/2004

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the PC system power cord was connected to the AC floor outlet since the power supply used in the EUT did not provide an accessory power outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBμV of specification limits), and are distinguished with a "**Qp**" in the data table.

For average measurement, the spectrum analyzer was set as RBW = 1MHz, VBW = 10Hz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Subpart C. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Subpart C Limit}$$

Summary of Test Results

Environmental Conditions

Temperature:	21° C
Relative Humidity:	38%
ATM Pressure:	1032 mbar

The testing was performed by Ming Jing on 2005-01-22.

According to the data in following tables, the EUT measured within the measurement uncertainty of the worst margin reading of ± 4.0 dB:

MCD2400PT36 Antenna (2.5dBi ceiling mount diversity antenna)*802.11g, 15.247***-7.5 dB at 2390.00 MHz in the Vertical polarization, Low Channel****-12.4 dB at 1320.25 MHz in the Vertical polarization, Middle Channel****-4.8 dB at 3155.80 MHz in the Vertical polarization, High Channel****-1.7 dB at 264.02 MHz in the Horizontal polarization, unintentional emission***802.11b, 15.247***-4.5 dB at 1731.61 MHz in the Vertical polarization, Low Channel****-17.3 dB at 4874.00 MHz in the Vertical polarization, Middle Channel****-12.6 dB at 3065.87 MHz in the Vertical polarization, High Channel****-1.7 dB at 264.02 MHz in the Horizontal polarization, unintentional emission*****MCO24005PT36 Antenna (5.5dBi Omni antenna)****802.11g, 15.247***-7.5 dB at 2390.00 MHz in the Vertical polarization, Low Channel****-13.7 dB at 1320.25 MHz in the Vertical polarization, Middle Channel****-1.2 dB at 3155.80 MHz in the Vertical polarization, High Channel****-1.1 dB at 396.02 MHz in the Horizontal polarization, unintentional emission***802.11b, 15.247***-9.4 dB at 1731.61 MHz in the Vertical polarization, Low Channel****-17.3 dB at 4874.00 MHz in the Vertical polarization, Middle Channel****-15.4 dB at 3065.87 MHz in the Vertical polarization, High Channel****-1.7 dB at 264.02 MHz in the Horizontal polarization, unintentional emission**

MHA2400PT Antenna (4 dBi ceiling mount bi-directional hallway)*802.11g, 15.247***-6.8 dB** at **2390.00 MHz** in the **Vertical** polarization, Low Channel**-15.0 dB** at **1320.25 MHz** in the **Vertical** polarization, Middle Channel**-4.2 dB** at **2483.50 MHz** in the **Vertical** polarization, High Channel**-0.8 dB** at **396.02 MHz** in the **Horizontal** polarization, unintentional emission*802.11b, 15.247***-2.9 dB** at **2390.00 MHz** in the **Vertical** polarization, Low Channel**-17.0 dB** at **4874.00 MHz** in the **Vertical** polarization, Middle Channel**-8.7 dB** at **3065.87 MHz** in the **Vertical** polarization, High Channel**-0.8 dB** at **396.02 MHz** in the **Vertical** polarization, unintentional emission**MP24013XFPTPT Antenna (13 dBi patch)***802.11g, 15.247***-1.7 dB** at **2390.00 MHz** in the **Vertical** polarization, Low Channel**-3.0 dB** at **1320.25 MHz** in the **Horizontal** polarization, Middle Channel**-0.9 dB** at **2483.50 MHz** in the **Vertical** polarization, High Channel**-0.7 dB** at **396.02 MHz** in the **Horizontal** polarization, unintentional emission*802.11b, 15.247***-6.4 dB** at **2390.00 MHz** in the **Vertical** polarization, Low Channel**-13.7 dB** at **1056.11 MHz** in the **Vertical** polarization, Middle Channel**-1.2 dB** at **3065.87 MHz** in the **Vertical** polarization, High Channel**-3.4 dB** at **132.01 MHz** in the **Vertical** polarization, unintentional emission

MCD2400PT36 Antenna (2.5dBi ceiling mount diversity antenna)**802.11g, 15.247**

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV/ m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-40GHz											
2412.00	112.5	Fund/Peak	270	1.2	v	28.1	3.4	35.5	108.5		
2412.00	98.8	Fund/Peak	180	1.5	h	28.1	3.4	35.5	94.8		
2412.00	102.7	Fund/Ave.	270	1.2	v	28.1	3.4	35.5	98.7		
2412.00	89.6	Fund/Ave.	180	1.5	h	28.1	3.4	35.5	85.6		
2390.00	50.5	Ave.	270	1.8	v	28.1	3.4	35.5	46.5	54	-7.5
2390.00	63.1	Peak	270	1.8	v	28.1	3.4	35.5	59.1	74	-14.9
1811.62	45.7	Ave.	110	1.5	v	25.3	2.6	35.5	38.1	54	-15.9
4824.00	34.1	Ave.	210	1.5	v	32.5	4.9	34.6	36.9	54	-17.1
4824.00	32.9	Ave.	90	1.5	h	32.5	4.9	34.6	35.7	54	-18.2
2390.00	39.8	Ave.	180	1.5	h	28.1	3.4	35.5	35.8	54	-18.3
1811.62	57.3	Peak	110	1.5	v	25.3	2.6	35.5	49.7	74	-24.3
4824.00	44.5	Peak	210	1.5	v	32.5	4.9	34.6	47.3	74	-26.7
1811.62	34.8	Ave.	30	1.5	h	25.3	2.6	35.5	27.2	54	-26.8
2390.00	51.2	Peak	180	1.5	h	28.1	3.4	35.5	47.2	74	-26.8
4824.00	43.2	Peak	90	1.5	h	32.5	4.9	34.6	46.0	74	-28.0
1811.62	46.6	Peak	30	1.5	h	25.3	2.6	35.5	39.0	74	-35.0
Middle Channel, 1-40GHz											
2437.00	113.9	Fund/Peak	210	1.5	v	28.1	3.4	35.5	109.9		
2437.00	101.2	Fund/Peak	180	1.2	h	28.1	3.4	35.5	97.2		
2437.00	104.8	Fund/Ave.	210	1.5	v	28.1	3.4	35.5	100.8		
2437.00	91.7	Fund/Ave.	180	1.2	h	28.1	3.4	35.5	87.7		
1320.25	50.2	Ave.	60	1.5	v	23.7	4.2	36.5	41.6	54	-12.4
1320.25	49.7	Ave.	0	1.2	h	23.7	4.2	36.5	41.1	54	-12.9
4874.00	34.5	Ave.	30	1.2	v	32.5	4.9	34.6	37.3	54	-16.7
4874.00	33.1	Ave.	270	1.5	h	32.5	4.9	34.6	35.9	54	-18.1
4874.00	44.7	Peak	30	1.2	v	32.5	4.9	34.6	47.5	74	-26.5
1320.25	55.4	Peak	60	1.5	v	23.7	4.2	36.5	46.8	74	-27.2
4874.00	43.4	Peak	270	1.5	h	32.5	4.9	34.6	46.2	74	-27.8
1320.25	54.6	Peak	0	1.2	h	23.7	4.2	36.5	46.0	74	-28.0

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dB μ V/ m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
High Channel, 1-40GHz											
2462.00	110.2	Fund/Peak	230	1.8	v	28.1	3.4	35.5	106.2		
2462.00	100.1	Fund/Peak	210	1.5	h	28.1	3.4	35.5	96.1		
2462.00	99.3	Fund/Ave.	230	1.8	v	28.1	3.4	35.5	95.3		
2462.00	90.4	Fund/Ave.	210	1.5	h	28.1	3.4	35.5	86.4		
2483.50	53.2	Ave.	230	1.8	v	28.1	3.4	35.5	49.2	54	-4.8
3155.80	49.8	Ave.	270	1.5	v	30.3	4.0	34.9	49.2	54	-4.8
3155.80	46.1	Ave.	90	1.6	h	30.3	4.0	34.9	45.5	54	-8.5
2483.50	48.6	Ave.	210	1.5	h	28.1	3.4	35.5	44.6	54	-9.4
2483.50	65.3	Peak	230	1.8	v	28.1	3.4	35.5	61.3	74	-12.7
3155.80	61.3	Peak	270	1.5	v	30.3	4.0	34.9	60.7	74	-13.3
3155.80	58.3	Peak	90	1.6	h	30.3	4.0	34.9	57.7	74	-16.3
4924.00	33.9	Ave.	90	1.2	v	32.5	4.9	34.6	36.7	54	-17.3
2483.50	60.2	Peak	210	1.5	h	28.1	3.4	35.5	56.2	74	-17.8
4924.00	32.6	Ave.	30	1.5	h	32.5	4.9	34.6	35.4	54	-18.6
4924.00	44.3	Peak	90	1.2	v	32.5	4.9	34.6	47.1	74	-26.9
4924.00	43.1	Peak	30	1.5	h	32.5	4.9	34.6	45.9	74	-28.1

Note:

- 1) FUND = Fundamental
- 2) AVG = average
- 3) The level is too low to be tested for third harmonic and above.

Unintentional Emission

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Ampl. dB μ V/m	Direction Degree	Height Meter	Polar H/V	Antenna dB	Cable Loss dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
264.02	55.6	180	1.2	h	13.4	2.2	26.9	44.3	46	-1.7
132.01	55.7	210	1.5	v	12.2	1.6	27.9	41.6	43.5	-1.9
396.02	51.8	180	1.5	h	16.4	2.5	27.3	43.4	46	-2.6
115.20	50.1	180	1.2	v	11.8	1.6	27.7	35.8	43.5	-7.7
228.87	41.2	270	1.5	h	12.6	2.2	27.3	28.7	46	-17.3
245.21	39.8	120	1.5	v	13.3	2.2	27.2	28.1	46	-17.9

802.11b, 15.247

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV/ m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-40GHz											
2412.00	112.1	Fund/Peak	270	1.8	v	28.1	3.4	35.5	108.1		
2412.00	101.2	Fund/Peak	90	1.5	h	28.1	3.4	35.5	97.2		
2412.00	104.9	Fund/Ave.	270	1.8	v	28.1	3.4	35.5	100.9		
2412.00	95.3	Fund/Ave.	90	1.5	h	28.1	3.4	35.5	91.3		
1731.61	58.4	Ave.	0	1.5	v	25.3	2.6	36.8	49.5	54	-4.5
1731.61	55.9	Ave.	45	1.2	h	25.3	2.6	36.8	47.0	54	-7.0
2390.00	49.8	Ave.	180	1.8	v	28.1	3.4	35.5	45.8	54	-8.2
2390.00	44.7	Ave.	210	1.8	h	28.1	3.4	35.5	40.7	54	-13.3
1731.61	68.8	Peak	0	1.5	v	25.3	2.6	36.8	59.9	74	-14.1
1731.61	67.5	Peak	45	1.2	h	25.3	2.6	36.8	58.6	74	-15.4
4824.00	33.7	Ave.	120	1.5	v	32.5	4.9	34.6	36.5	54	-17.5
2390.00	59.5	Peak	180	1.8	v	28.1	3.4	35.5	55.5	74	-18.5
4824.00	32.5	Ave.	180	1.2	h	32.5	4.9	34.6	35.3	54	-18.7
2390.00	54.3	Peak	210	1.8	h	28.1	3.4	35.5	50.3	74	-23.7
1188.03	38.6	Ave.	110	1.2	h	23.7	4.2	36.8	29.7	54	-24.3
1188.03	38.2	Ave.	90	1.5	v	23.7	4.2	36.8	29.3	54	-24.7
4824.00	44.4	Peak	120	1.5	v	32.5	4.9	34.6	47.2	74	-26.8
4824.00	43.1	Peak	180	1.2	h	32.5	4.9	34.6	45.9	74	-28.1
1188.03	47.7	Peak	110	1.2	h	23.7	4.2	36.8	38.8	74	-35.2
1188.03	46.5	Peak	90	1.5	v	23.7	4.2	36.8	37.6	74	-36.4
Middle Channel, 1-40GHz											
2437.00	112.6	Fund/Peak	180	1.5	v	28.1	3.4	35.2	108.9		
2437.00	101.7	Fund/Peak	210	1.5	h	28.1	3.4	35.2	98.0		
2437.00	105.4	Fund/Ave.	180	1.5	v	28.1	3.4	35.2	101.7		
2437.00	95.9	Fund/Ave.	210	1.5	h	28.1	3.4	35.2	92.2		
4874.00	33.9	Ave.	180	1.5	v	32.5	4.9	34.6	36.7	54	-17.3
4874.00	32.7	Ave.	230	1.2	h	32.5	4.9	34.6	35.5	54	-18.5
1056.11	42.7	Ave.	270	1.2	v	23.7	4.2	36.8	33.8	54	-20.2
1056.11	42.4	Ave.	310	1.8	h	23.7	4.2	36.8	33.5	54	-20.5
4874.00	44.5	Peak	180	1.5	v	32.5	4.9	34.6	47.3	74	-26.7
4874.00	43.2	Peak	230	1.2	h	32.5	4.9	34.6	46.0	74	-28.0
1056.11	48.9	Peak	270	1.2	v	23.7	4.2	36.8	40.0	74	-34.0
1056.11	48.6	Peak	310	1.8	h	23.7	4.2	36.8	39.7	74	-34.3

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dB μ V/ m	Comments	Angle Degree	Height Meter	Polar H/V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
High Channel, 1-40GHz											
2462.00	107.4	Fund/Peak	30	1.6	v	28.1	3.4	35.2	103.7		
2462.00	98.6	Fund/Peak	90	1.5	h	28.1	3.4	35.2	94.9		
2462.00	101.7	Fund/Ave.	30	1.6	v	28.1	3.4	35.2	98.0		
2462.00	92.3	Fund/Ave.	90	1.5	h	28.1	3.4	35.2	88.6		
3065.87	42.3	Ave.	180	1.5	v	30.3	4.0	35.2	41.4	54	-12.6
4924.00	33.7	Ave.	180	1.5	v	32.5	4.9	34.6	36.5	54	-17.5
4924.00	32.4	Ave.	0	1.2	h	32.5	4.9	34.6	35.2	54	-18.8
3065.87	35.2	Ave.	270	1.5	h	30.3	4.0	35.2	34.3	54	-19.7
3065.87	52.9	Peak	180	1.5	v	30.3	4.0	35.2	52.0	74	-22.0
4924.00	44.2	Peak	180	1.5	v	32.5	4.9	34.6	47.0	74	-27.0
4924.00	42.9	Peak	0	1.2	h	32.5	4.9	34.6	45.7	74	-28.3
3065.87	46.5	Peak	270	1.5	h	30.3	4.0	35.2	45.6	74	-28.4

Note:

- 1) FUND = Fundamental
- 2) AVG = average
- 3) The level is too low to be tested for third harmonic and above.

Unintentional Emission

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Ampl. dB μ V/m	Direction Degree	Height Meter	Polar H/V	Antenna dB	Cable Loss dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
264.02	55.6	180	1.2	h	13.4	2.2	26.9	44.3	46	-1.7
132.01	55.7	210	1.5	v	12.2	1.6	27.9	41.6	43.5	-1.9
396.02	51.8	180	1.5	h	16.4	2.5	27.3	43.4	46	-2.6
120.18	50.1	180	1.2	v	11.8	1.6	27.7	35.8	43.5	-7.7
228.87	41.2	270	1.5	h	12.6	2.2	27.3	28.7	46	-17.3
245.21	39.8	120	1.5	v	13.3	2.2	27.2	28.1	46	-17.9

MCO24005PT36 Antenna (5.5dBi Omni antenna)**802.11g, 15.247**

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV/ m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-40GHz											
2412.00	113.6	Fund/Peak	0	1.2	v	28.1	3.4	35.5	109.6		
2412.00	102.6	Fund/Peak	180	1.5	h	28.1	3.4	35.5	98.6		
2412.00	104.3	Fund/Ave.	0	1.2	v	28.1	3.4	35.5	100.3		
2412.00	94.2	Fund/Ave.	180	1.5	h	28.1	3.4	35.5	90.2		
2390.00	50.5	Ave.	270	1.8	v	28.1	3.4	35.5	46.5	54	-7.5
2390.00	63.1	Peak	270	1.8	v	28.1	3.4	35.5	59.1	74	-14.9
4824.00	33.7	Ave.	210	1.5	v	32.5	4.9	34.6	36.5	54	-17.5
2390.00	39.8	Ave.	180	1.5	h	28.1	3.4	35.5	35.8	54	-18.2
4824.00	32.5	Ave.	90	1.5	h	32.5	4.9	34.6	35.3	54	-18.7
1811.62	42.7	Ave.	60	1.5	v	25.3	2.6	35.5	35.1	54	-18.9
2390.00	51.2	Peak	180	1.5	h	28.1	3.4	35.5	47.2	74	-26.8
4824.00	44.2	Peak	210	1.5	v	32.5	4.9	34.6	47.0	74	-27.0
1811.62	33.6	Ave.	120	1.5	h	25.3	2.6	35.5	26.0	54	-28.0
4824.00	43.1	Peak	90	1.5	h	32.5	4.9	34.6	45.9	74	-28.1
1811.62	53.4	Peak	60	1.5	v	25.3	2.6	35.5	45.8	74	-28.2
1811.62	44.5	Peak	120	1.5	h	25.3	2.6	35.5	36.9	74	-37.1
Middle Channel, 1-40GHz											
2437.00	114.1	Fund/Peak	60	1.5	v	28.1	3.4	35.5	110.1		
2437.00	101.5	Fund/Peak	180	1.2	h	28.1	3.4	35.5	97.5		
2437.00	103.4	Fund/Ave.	60	1.5	v	28.1	3.4	35.5	99.4		
2437.00	91.8	Fund/Ave.	180	1.2	h	28.1	3.4	35.5	87.8		
1320.25	48.9	Ave.	310	1.5	v	23.7	4.2	36.5	40.3	54	-13.7
1320.25	48.2	Ave.	270	1.2	h	23.7	4.2	36.5	39.6	54	-14.4
4874.00	33.8	Ave.	30	1.2	v	32.5	4.9	34.6	36.6	54	-17.4
4874.00	32.6	Ave.	270	1.5	h	32.5	4.9	34.6	35.4	54	-18.6
4874.00	44.3	Peak	30	1.2	v	32.5	4.9	34.6	47.1	74	-26.9
1320.25	54.9	Peak	310	1.5	v	23.7	4.2	36.5	46.3	74	-27.7
4874.00	43.2	Peak	270	1.5	h	32.5	4.9	34.6	46.0	74	-28.0
1320.25	54.1	Peak	270	1.2	h	23.7	4.2	36.5	45.5	74	-28.5

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV /m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
High Channel, 1-40GHz											
2462.00	111.5	Fund/Peak	90	1.5	v	28.1	3.4	35.5	107.5		
2462.00	101.3	Fund/Peak	30	1.2	h	28.1	3.4	35.5	97.3		
2462.00	102.6	Fund/Ave.	90	1.5	v	28.1	3.4	35.5	98.6		
2462.00	92.4	Fund/Ave.	30	1.2	h	28.1	3.4	35.5	88.4		
3155.80	53.4	Ave.	210	1.2	v	30.3	4.0	34.9	52.8	54	-1.2
2483.50	54.3	Ave.	90	1.5	v	28.1	3.4	35.5	50.3	54	-3.7
3155.80	67.8	Peak	270	1.2	v	30.3	4.0	34.9	67.2	74	-6.8
2483.50	49.7	Ave.	30	1.2	h	28.1	3.4	35.5	45.7	54	-8.3
3155.80	46.3	Ave.	250	1.5	h	30.3	4.0	34.9	45.7	54	-8.3
2483.50	66.4	Peak	90	1.5	v	28.1	3.4	35.5	62.4	74	-11.6
3155.80	58.5	Peak	250	1.5	h	30.3	4.0	34.9	57.9	74	-16.1
2483.50	61.5	Peak	30	1.2	h	28.1	3.4	35.5	57.5	74	-16.5
4924.00	33.6	Ave.	0	1.2	v	32.5	4.9	34.6	36.4	54	-17.6
4924.00	32.3	Ave.	120	1.5	h	32.5	4.9	34.6	35.1	54	-18.9
4924.00	44.1	Peak	0	1.2	v	32.5	4.9	34.6	46.9	74	-27.1
4924.00	42.9	Peak	120	1.5	h	32.5	4.9	34.6	45.7	74	-28.3

Note:

- 1) FUND = Fundamental
- 2) AVG = average
- 3) The level is too low to be tested for third harmonic and above.

Unintentional Emission

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Ampl. dBμV/m	Direction Degree	Height Meter	Polar H/V	Antenna dB	Cable Loss dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
396.02	53.3	180	1.5	h	16.4	2.5	27.3	44.9	46	-1.1
264.02	52.9	180	1.2	h	13.4	2.2	26.9	41.6	46	-4.4
115.20	50.9	180	1.2	v	11.8	1.6	27.7	36.6	43.5	-6.9
132.01	46.8	210	1.5	v	12.2	1.6	27.9	32.7	43.5	-10.8
228.87	39.8	270	1.5	h	12.6	2.2	27.3	27.3	46	-18.7
245.21	37.5	120	1.5	v	13.3	2.2	27.2	25.8	46	-20.2

802.11b, 15.247

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV/ m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-40GHz											
2412.00	114.9	Fund/Peak	180	1.2	v	28.1	3.4	35.5	110.9		
2412.00	103.4	Fund/Peak	30	1.5	h	28.1	3.4	35.5	99.4		
2412.00	107.1	Fund/Ave.	180	1.2	v	28.1	3.4	35.5	103.1		
2412.00	97.6	Fund/Ave.	30	1.5	h	28.1	3.4	35.5	93.6		
1731.61	53.5	Ave.	15	1.5	v	25.3	2.6	36.8	44.6	54	-9.4
2390.00	47.5	Ave.	180	1.2	v	28.1	3.4	35.5	43.5	54	-10.5
1731.61	50.6	Ave.	60	1.2	h	25.3	2.6	36.8	41.7	54	-12.3
2390.00	42.6	Ave.	30	1.5	h	28.1	3.4	35.5	38.6	54	-15.4
4824.00	33.9	Ave.	0	1.5	v	32.5	4.9	34.6	36.7	54	-17.3
4824.00	32.8	Ave.	60	1.2	h	32.5	4.9	34.6	35.6	54	-18.4
1731.61	63.8	Peak	15	1.5	v	25.3	2.6	36.8	54.9	74	-19.1
1731.61	62.7	Peak	60	1.2	h	25.3	2.6	36.8	53.8	74	-20.2
2390.00	56.1	Peak	180	1.2	v	28.1	3.4	35.5	52.1	74	-21.9
1188.03	39.1	Ave.	30	1.2	h	23.7	4.2	36.8	30.2	54	-23.8
1188.03	38.6	Ave.	90	1.5	v	23.7	4.2	36.8	29.7	54	-24.3
2390.00	52.4	Peak	30	1.5	h	28.1	3.4	35.5	48.4	74	-25.6
4824.00	44.6	Peak	0	1.5	v	32.5	4.9	34.6	47.4	74	-26.6
4824.00	43.3	Peak	60	1.2	h	32.5	4.9	34.6	46.1	74	-27.9
1188.03	48.3	Peak	30	1.2	h	23.7	4.2	36.8	39.4	74	-34.6
1188.03	47.1	Peak	90	1.5	v	23.7	4.2	36.8	38.2	74	-35.8
Middle Channel, 1-40GHz											
2437.00	113.8	Fund/Peak	0	1.5	v	28.1	3.4	35.2	110.1		
2437.00	102.5	Fund/Peak	210	1.5	h	28.1	3.4	35.2	98.8		
2437.00	106.2	Fund/Ave.	0	1.5	v	28.1	3.4	35.2	102.5		
2437.00	96.7	Fund/Ave.	210	1.5	h	28.1	3.4	35.2	93.0		
4874.00	33.8	Ave.	180	1.5	v	32.5	4.9	34.6	36.6	54	-17.4
4874.00	32.6	Ave.	230	1.2	h	32.5	4.9	34.6	35.4	54	-18.6
1056.11	42.5	Ave.	90	1.5	v	23.7	4.2	36.8	33.6	54	-20.4
1056.11	42.1	Ave.	310	1.8	h	23.7	4.2	36.8	33.2	54	-20.8
4874.00	44.5	Peak	180	1.5	v	32.5	4.9	34.6	47.3	74	-26.7
4874.00	43.1	Peak	230	1.2	h	32.5	4.9	34.6	45.9	74	-28.1
1056.11	48.7	Peak	90	1.5	v	23.7	4.2	36.8	39.8	74	-34.2
1056.11	48.2	Peak	310	1.8	h	23.7	4.2	36.8	39.3	74	-34.7

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dB μ V /m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
High Channel, 1-40GHz											
2462.00	108.6	Fund/Peak	45	1.6	v	28.1	3.4	35.2	104.9		
2462.00	99.7	Fund/Peak	90	1.5	h	28.1	3.4	35.2	96.0		
2462.00	102.9	Fund/Ave.	45	1.6	v	28.1	3.4	35.2	99.2		
2462.00	93.4	Fund/Ave.	90	1.5	h	28.1	3.4	35.2	89.7		
3065.87	39.5	Ave.	90	1.5	v	30.3	4.0	35.2	38.6	54	-15.4
4924.00	33.7	Ave.	180	1.5	v	32.5	4.9	34.6	36.5	54	-17.5
4924.00	32.4	Ave.	0	1.2	h	32.5	4.9	34.6	35.2	54	-18.8
3065.87	32.4	Ave.	270	1.5	h	30.3	4.0	35.2	31.5	54	-22.5
3065.87	49.2	Peak	90	1.5	v	30.3	4.0	35.2	48.3	74	-25.7
4924.00	44.3	Peak	180	1.5	v	32.5	4.9	34.6	47.1	74	-26.9
4924.00	42.9	Peak	0	1.2	h	32.5	4.9	34.6	45.7	74	-28.3
3065.87	43.6	Peak	270	1.5	h	30.3	4.0	35.2	42.7	74	-31.3

Note:

- 1) FUND = Fundamental
- 2) AVG = average
- 3) The level is too low to be tested for third harmonic and above.

Unintentional Emission

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Ampl. dB μ V/m	Direction Degree	Height Meter	Polar H/V	Antenna dB	Cable Loss dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
264.02	55.6	180	1.2	h	13.4	2.2	26.9	44.3	46	-1.7
132.01	55.7	210	1.5	v	12.2	1.6	27.9	41.6	43.5	-1.9
396.02	51.8	180	1.5	h	16.4	2.5	27.3	43.4	46	-2.6
120.18	50.1	180	1.2	v	11.8	1.6	27.7	35.8	43.5	-7.7
228.87	41.2	270	1.5	h	12.6	2.2	27.3	28.7	46	-17.3
245.21	39.8	120	1.5	v	13.3	2.2	27.2	28.1	46	-17.9

MHA2400PT Antenna (4 dBi ceiling mount bi-directional hallway)**802.11g, 15.247**

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV/ m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-40GHz											
2412.00	114.3	Fund/Peak	0	1.5	v	28.1	3.4	35.5	110.3		
2412.00	101.9	Fund/Peak	30	1.5	h	28.1	3.4	35.5	97.8		
2412.00	103.5	Fund/Ave.	0	1.5	v	28.1	3.4	35.5	99.5		
2412.00	93.1	Fund/Ave.	30	1.5	h	28.1	3.4	35.5	89.1		
2390.00	51.2	Ave.	230	1.5	v	28.1	3.4	35.5	47.2	54	-6.8
2390.00	65.4	Peak	230	1.5	v	28.1	3.4	35.5	61.4	74	-12.6
2390.00	40.7	Ave.	180	1.5	h	28.1	3.4	35.5	36.7	54	-17.3
4824.00	32.5	Ave.	180	1.2	v	32.5	4.9	34.6	35.3	54	-18.7
4824.00	32.1	Ave.	90	1.5	h	32.5	4.9	34.6	34.9	54	-19.1
1811.62	41.3	Ave.	90	1.5	v	25.3	2.6	35.5	33.7	54	-20.3
2390.00	51.6	Peak	180	1.5	h	28.1	3.4	35.5	47.6	74	-26.4
4824.00	44.5	Peak	180	1.2	v	32.5	4.9	34.6	47.3	74	-26.7
1811.62	54.9	Peak	90	1.5	v	25.3	2.6	35.5	47.3	74	-26.7
4824.00	44.2	Peak	90	1.5	h	32.5	4.9	34.6	47.0	74	-27.0
1811.62	33.8	Ave.	120	1.5	h	25.3	2.6	35.5	26.2	54	-27.8
1811.62	44.7	Peak	120	1.5	h	25.3	2.6	35.5	37.1	74	-36.9
Middle Channel, 1-40GHz											
2437.00	115.6	Fund/Peak	120	1.5	v	28.1	3.4	35.5	111.6		
2437.00	106.8	Fund/Peak	180	1.2	h	28.1	3.4	35.5	102.8		
2437.00	105.2	Fund/Ave.	120	1.5	v	28.1	3.4	35.5	101.2		
2437.00	97.4	Fund/Ave.	180	1.2	h	28.1	3.4	35.5	93.4		
1320.25	47.6	Ave.	180	1.6	v	23.7	4.2	36.5	39.0	54	-15.0
1320.25	46.4	Ave.	180	1.5	h	23.7	4.2	36.5	37.8	54	-16.2
4874.00	32.6	Ave.	30	1.2	v	32.5	4.9	34.6	35.4	54	-18.6
4874.00	32.4	Ave.	270	1.5	h	32.5	4.9	34.6	35.2	54	-18.8
1320.25	56.8	Peak	180	1.6	v	23.7	4.2	36.5	48.2	74	-25.8
4874.00	44.7	Peak	30	1.2	v	32.5	4.9	34.6	47.5	74	-26.5
4874.00	44.5	Peak	270	1.5	h	32.5	4.9	34.6	47.3	74	-26.7
1320.25	55.9	Peak	180	1.5	h	23.7	4.2	36.5	47.3	74	-26.7

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV /m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
High Channel, 1-40GHz											
2462.00	111.2	Fund/Peak	210	1.5	v	28.1	3.4	35.5	107.2		
2462.00	101.6	Fund/Peak	330	1.2	h	28.1	3.4	35.5	97.6		
2462.00	101.5	Fund/Ave.	210	1.5	v	28.1	3.4	35.5	97.5		
2462.00	92.7	Fund/Ave.	330	1.2	h	28.1	3.4	35.5	88.7		
2483.50	53.8	Ave.	0	1.5	v	28.1	3.4	35.5	49.8	54	-4.2
2483.50	70.8	Peak	0	1.5	v	28.1	3.4	35.5	66.8	74	-7.2
3155.80	44.2	Ave.	270	1.2	v	30.3	4.0	34.9	43.6	54	-10.4
3155.80	43.7	Ave.	30	1.5	h	30.3	4.0	34.9	43.1	54	-10.9
2483.50	45.6	Ave.	180	1.6	h	28.1	3.4	35.5	41.6	54	-12.5
2483.50	61.9	Peak	180	1.6	h	28.1	3.4	35.5	57.9	74	-16.2
4924.00	33.8	Ave.	0	1.2	v	32.5	4.9	34.6	36.6	54	-17.4
4924.00	32.6	Ave.	120	1.5	h	32.5	4.9	34.6	35.4	54	-18.6
3155.80	54.8	Peak	270	1.2	v	30.3	4.0	34.9	54.2	74	-19.8
3155.80	52.2	Peak	30	1.5	h	30.3	4.0	34.9	51.6	74	-22.4
4924.00	44.3	Peak	0	1.2	v	32.5	4.9	34.6	47.1	74	-26.9
4924.00	43.2	Peak	120	1.5	h	32.5	4.9	34.6	46.0	74	-28.0

Note:

- 1) FUND = Fundamental
- 2) AVG = average
- 3) The level is too low to be tested for third harmonic and above.

Unintentional Emission

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Ampl. dBμV/m	Direction Degree	Height Meter	Polar H/V	Antenna dB	Cable Loss dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
396.02	53.6	180	1.2	h	16.4	2.5	27.3	45.2	46	-0.8
132.01	53.9	210	1.5	v	12.2	1.6	27.9	39.8	43.5	-3.7
264.02	53.1	180	1.8	h	13.4	2.2	26.9	41.8	46	-4.2
115.20	51.5	180	1.2	v	11.8	1.6	27.7	37.2	43.5	-6.3
228.87	46.3	270	1.6	h	12.6	2.2	27.3	33.8	46	-12.2
245.21	37.7	120	1.2	v	13.3	2.2	27.2	26.0	46	-20.0

802.11b, 15.247

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV/ m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-40GHz											
2412.00	116.2	Fund/Peak	30	1.5	v	28.1	3.4	35.5	112.2		
2412.00	101.4	Fund/Peak	210	1.5	h	28.1	3.4	35.5	97.4		
2412.00	110.6	Fund/Ave.	30	1.5	v	28.1	3.4	35.5	106.6		
2412.00	95.9	Fund/Ave.	210	1.5	h	28.1	3.4	35.5	91.9		
2390.00	50.1	Ave.	0	1.2	v	28.1	3.4	35.5	46.1	54	-7.9
1731.61	52.6	Ave.	15	1.5	v	25.3	2.6	36.8	43.7	54	-10.3
2390.00	45.7	Ave.	30	1.5	h	28.1	3.4	35.5	41.7	54	-12.3
1731.61	49.8	Ave.	210	1.2	h	25.3	2.6	36.8	40.9	54	-13.1
4824.00	34.4	Ave.	90	1.5	v	32.5	4.9	34.6	37.2	54	-16.8
4824.00	32.9	Ave.	60	1.2	h	32.5	4.9	34.6	35.7	54	-18.3
2390.00	59.4	Peak	0	1.2	v	28.1	3.4	35.5	55.4	74	-18.6
1731.61	62.7	Peak	15	1.5	v	25.3	2.6	36.8	53.8	74	-20.2
1731.61	61.5	Peak	210	1.2	h	25.3	2.6	36.8	52.6	74	-21.4
1188.03	40.3	Ave.	90	1.2	h	23.7	4.2	36.8	31.4	54	-22.6
2390.00	55.2	Peak	30	1.5	h	28.1	3.4	35.5	51.2	74	-22.8
1188.03	39.5	Ave.	110	1.5	v	23.7	4.2	36.8	30.6	54	-23.4
4824.00	44.8	Peak	90	1.5	v	32.5	4.9	34.6	47.6	74	-26.4
4824.00	43.5	Peak	60	1.2	h	32.5	4.9	34.6	46.3	74	-27.7
1188.03	49.4	Peak	90	1.2	h	23.7	4.2	36.8	40.5	74	-33.5
1188.03	48.2	Peak	110	1.5	v	23.7	4.2	36.8	39.3	74	-34.7
Middle Channel, 1-40GHz											
2437.00	115.3	Fund/Peak	210	1.5	v	28.1	3.4	35.2	111.6		
2437.00	103.8	Fund/Peak	180	1.5	h	28.1	3.4	35.2	100.1		
2437.00	109.7	Fund/Ave.	210	1.5	v	28.1	3.4	35.2	106.0		
2437.00	98.5	Fund/Ave.	180	1.5	h	28.1	3.4	35.2	94.8		
4874.00	34.2	Ave.	0	1.5	v	32.5	4.9	34.6	37.0	54	-17.0
4874.00	32.7	Ave.	230	1.2	h	32.5	4.9	34.6	35.5	54	-18.5
1056.11	43.7	Ave.	180	1.5	v	23.7	4.2	36.8	34.8	54	-19.2
1056.11	42.3	Ave.	310	1.8	h	23.7	4.2	36.8	33.4	54	-20.6
4874.00	44.7	Peak	0	1.5	v	32.5	4.9	34.6	47.5	74	-26.5
4874.00	43.3	Peak	230	1.2	h	32.5	4.9	34.6	46.1	74	-27.9
1056.11	53.5	Peak	180	1.5	v	23.7	4.2	36.8	44.6	74	-29.4
1056.11	51.9	Peak	310	1.8	h	23.7	4.2	36.8	43.0	74	-31.0

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency	Ampl.	Comments	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV /m		Degree	Meter	H/ V	dB	dB	dB	dBμV/m	dBμV/m	dB
High Channel, 1-40GHz											
2462.00	110.5	Fund/Peak	45	1.5	v	28.1	3.4	35.2	106.8		
2462.00	99.8	Fund/Peak	180	1.2	h	28.1	3.4	35.2	96.1		
2462.00	104.2	Fund/Ave.	45	1.6	v	28.1	3.4	35.2	100.5		
2462.00	90.1	Fund/Ave.	180	1.2	h	28.1	3.4	35.2	86.4		
3065.87	46.2	Ave.	210	1.5	v	30.3	4.0	35.2	45.3	54	-8.7
4924.00	33.9	Ave.	60	1.5	v	32.5	4.9	34.6	36.7	54	-17.3
4924.00	32.5	Ave.	0	1.2	h	32.5	4.9	34.6	35.3	54	-18.7
3065.87	55.6	Peak	210	1.5	v	30.3	4.0	35.2	54.7	74	-19.3
3065.87	32.7	Ave.	270	1.5	h	30.3	4.0	35.2	31.8	54	-22.2
4924.00	44.5	Peak	60	1.5	v	32.5	4.9	34.6	47.3	74	-26.7
4924.00	43.1	Peak	0	1.2	h	32.5	4.9	34.6	45.9	74	-28.1
3065.87	43.9	Peak	270	1.5	h	30.3	4.0	35.2	43.0	74	-31.0

Note:

- 1) FUND = Fundamental
- 2) AVG = average
- 3) The level is too low to be tested for third harmonic and above.

Unintentional Emission

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/V	dB	dB	dB	dBμV/m	dBμV/m	dB
396.02	53.6	180	1.2	h	16.4	2.5	27.3	45.2	46	-0.8
132.01	53.9	210	1.5	v	12.2	1.6	27.9	39.8	43.5	-3.7
264.02	53.1	180	1.8	h	13.4	2.2	26.9	41.8	46	-4.2
115.20	51.5	180	1.2	v	11.8	1.6	27.7	37.2	43.5	-6.3
228.87	46.3	270	1.6	h	12.6	2.2	27.3	33.8	46	-12.2
245.21	37.7	120	1.2	v	13.3	2.2	27.2	26.0	46	-20.0

MP24013XFPTPT Antenna (13 dBi patch)**802.11g, 15.247**

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV/ m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-40GHz											
2412.00	114.1	Fund/Peak	0	1.5	v	28.1	3.4	35.5	110.1		
2412.00	98.2	Fund/Peak	0	1.5	h	28.1	3.4	35.5	94.2		
2412.00	105.8	Fund/Ave.	0	1.5	v	28.1	3.4	35.5	101.8		
2412.00	90.1	Fund/Ave.	0	1.5	h	28.1	3.4	35.5	86.1		
2390.00	76.3	Peak	0	1.5	v	28.1	3.4	35.5	72.3	74	-1.7
2390.00	56.1	Ave.	0	1.5	v	28.1	3.4	35.5	52.1	54	-1.9
2390.00	41.4	Ave.	0	1.6	h	28.1	3.4	35.5	37.4	54	-16.6
4824.00	32.7	Ave.	160	1.2	v	32.5	4.9	34.6	35.5	54	-18.5
4824.00	32.3	Ave.	30	1.5	h	32.5	4.9	34.6	35.1	54	-18.9
1811.62	40.6	Ave.	90	1.5	v	25.3	2.6	35.5	33.0	54	-21.0
2390.00	52.5	Peak	0	1.6	h	28.1	3.4	35.5	48.5	74	-25.4
4824.00	44.6	Peak	160	1.2	v	32.5	4.9	34.6	47.4	74	-26.6
4824.00	44.3	Peak	30	1.5	h	32.5	4.9	34.6	47.1	74	-26.9
1811.62	53.7	Peak	90	1.5	v	25.3	2.6	35.5	46.1	74	-27.9
1811.62	32.9	Ave.	110	1.5	h	25.3	2.6	35.5	25.3	54	-28.7
1811.62	43.5	Peak	110	1.5	h	25.3	2.6	35.5	35.9	74	-38.1
Middle Channel, 1-40GHz											
2437.00	121.6	Fund/Peak	0	1.5	v	28.1	3.4	35.5	117.6		
2437.00	107.4	Fund/Peak	0	1.2	h	28.1	3.4	35.5	103.4		
2437.00	110.8	Fund/Ave.	0	1.5	v	28.1	3.4	35.5	106.8		
2437.00	96.9	Fund/Ave.	0	1.2	h	28.1	3.4	35.5	92.9		
1320.25	59.6	Ave.	230	1.5	h	23.7	4.2	36.5	51.0	54	-3.0
1320.25	57.2	Ave.	210	1.6	v	23.7	4.2	36.5	48.6	54	-5.4
1320.25	66.2	Peak	230	1.5	h	23.7	4.2	36.5	57.6	74	-16.4
1320.25	64.8	Peak	210	1.6	v	23.7	4.2	36.5	56.2	74	-17.8
4874.00	32.5	Ave.	30	1.2	v	32.5	4.9	34.6	35.3	54	-18.7
4874.00	32.1	Ave.	270	1.5	h	32.5	4.9	34.6	34.9	54	-19.1
4874.00	44.5	Peak	30	1.2	v	32.5	4.9	34.6	47.3	74	-26.7
4874.00	44.1	Peak	270	1.5	h	32.5	4.9	34.6	46.9	74	-27.1

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dB μ V /m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
High Channel, 1-40GHz											
2462.00	114.6	Fund/Peak	0	1.6	v	28.1	3.4	35.5	110.6		
2462.00	98.7	Fund/Peak	0	1.6	h	28.1	3.4	35.5	94.7		
2462.00	106.3	Fund/Ave.	0	1.6	v	28.1	3.4	35.5	102.3		
2462.00	90.6	Fund/Ave.	0	1.6	h	28.1	3.4	35.5	86.6		
2483.50	77.1	Peak	0	1.5	v	28.1	3.4	35.5	73.1	74	-0.9
2483.50	56.8	Ave.	0	1.5	v	28.1	3.4	35.5	52.8	54	-1.2
3155.80	51.3	Ave.	0	1.2	v	30.3	4.0	34.9	50.7	54	-3.3
3155.80	47.2	Ave.	30	1.5	h	30.3	4.0	34.9	46.6	54	-7.4
3155.80	62.9	Peak	0	1.2	v	30.3	4.0	34.9	62.3	74	-11.7
3155.80	58.4	Peak	30	1.5	h	30.3	4.0	34.9	57.8	74	-16.2
4924.00	32.9	Ave.	90	1.2	v	32.5	4.9	34.6	35.7	54	-18.3
4924.00	32.6	Ave.	120	1.5	h	32.5	4.9	34.6	35.4	54	-18.6
2483.50	38.2	Ave.	0	1.6	h	28.1	3.4	35.5	34.2	54	-19.8
2483.50	52.6	Peak	0	1.6	h	28.1	3.4	35.5	48.6	74	-25.4
4924.00	44.7	Peak	90	1.2	v	32.5	4.9	34.6	47.5	74	-26.5
4924.00	44.5	Peak	120	1.5	h	32.5	4.9	34.6	47.3	74	-26.7

Note:

- 1) FUND = Fundamental
- 2) AVG = average
- 3) The EUT reduced 3 dB for TX power at ch. 1 and ch. 11.
- 4) The level is too low to be tested for third harmonic and above.

Unintentional Emission

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Ampl. dB μ V/m	Direction Degree	Height Meter	Polar H/V	Antenna dB	Cable Loss dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
396.02	53.7	180	1.2	h	16.4	2.5	27.3	45.3	46	-0.7
132.01	54.2	210	1.5	v	12.2	1.6	27.9	40.1	43.5	-3.4
264.02	52.8	180	1.8	h	13.4	2.2	26.9	41.5	46	-4.5
115.20	51.7	180	1.2	v	11.8	1.6	27.7	37.4	43.5	-6.1
228.87	46.5	270	1.6	h	12.6	2.2	27.3	34.0	46	-12.0
245.21	37.9	120	1.2	v	13.3	2.2	27.2	26.2	46	-19.8

802.11b, 15.247

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dBμV/ m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Channel, 1-40GHz											
2412.00	118.3	Fund/Peak	0	1.2	v	28.1	3.4	35.5	114.3		
2412.00	102.9	Fund/Peak	0	1.5	h	28.1	3.4	35.5	98.9		
2412.00	110.3	Fund/Ave.	0	1.2	v	28.1	3.4	35.5	106.3		
2412.00	95.1	Fund/Ave.	0	1.5	h	28.1	3.4	35.5	91.1		
2390.00	51.6	Ave.	0	1.5	v	28.1	3.4	35.5	47.6	54	-6.4
1731.61	55.8	Ave.	0	1.5	v	25.3	2.6	36.8	46.9	54	-7.1
1731.61	52.9	Ave.	180	1.2	h	25.3	2.6	36.8	44.0	54	-10.0
2390.00	62.8	Peak	0	1.5	v	28.1	3.4	35.5	58.8	74	-15.2
4824.00	34.4	Ave.	90	1.5	v	32.5	4.9	34.6	37.2	54	-16.8
1731.61	65.6	Peak	0	1.5	v	25.3	2.6	36.8	56.7	74	-17.3
1731.61	64.7	Peak	180	1.2	h	25.3	2.6	36.8	55.8	74	-18.2
4824.00	32.9	Ave.	60	1.2	h	32.5	4.9	34.6	35.7	54	-18.3
2390.00	36.5	Ave.	0	1.6	h	28.1	3.4	35.5	32.5	54	-21.5
1188.03	41.1	Ave.	30	1.5	v	23.7	4.2	36.8	32.2	54	-21.8
1188.03	40.7	Ave.	90	1.2	h	23.7	4.2	36.8	31.8	54	-22.2
4824.00	44.8	Peak	90	1.5	v	32.5	4.9	34.6	47.6	74	-26.4
4824.00	43.5	Peak	60	1.2	h	32.5	4.9	34.6	46.3	74	-27.7
1188.03	52.2	Peak	30	1.5	v	23.7	4.2	36.8	43.3	74	-30.7
2390.00	47.2	Peak	0	1.6	h	28.1	3.4	35.5	43.2	74	-30.8
1188.03	49.8	Peak	90	1.2	h	23.7	4.2	36.8	40.9	74	-33.1
Middle Channel, 1-40GHz											
2437.00	121.1	Fund/Peak	0	1.5	v	28.1	3.4	35.2	117.4		
2437.00	106.3	Fund/Peak	0	1.5	h	28.1	3.4	35.2	102.6		
2437.00	112.2	Fund/Ave.	0	1.5	v	28.1	3.4	35.2	108.5		
2437.00	97.4	Fund/Ave.	0	1.5	h	28.1	3.4	35.2	93.7		
1056.11	49.2	Ave.	180	1.5	v	23.7	4.2	36.8	40.3	54	-13.7
1056.11	47.8	Ave.	310	1.8	h	23.7	4.2	36.8	38.9	54	-15.1
4874.00	34.2	Ave.	0	1.5	v	32.5	4.9	34.6	37.0	54	-17.0
4874.00	32.7	Ave.	230	1.2	h	32.5	4.9	34.6	35.5	54	-18.5
1056.11	59.1	Peak	180	1.5	v	23.7	4.2	36.8	50.2	74	-23.8
1056.11	57.4	Peak	310	1.8	h	23.7	4.2	36.8	48.5	74	-25.5
4874.00	44.7	Peak	0	1.5	v	32.5	4.9	34.6	47.5	74	-26.5
4874.00	43.3	Peak	230	1.2	h	32.5	4.9	34.6	46.1	74	-27.9

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.247	
Frequency MHz	Ampl. dB μ V /m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
High Channel, 1-40GHz											
2462.00	120.9	Fund/Peak	0	1.5	v	28.1	3.4	35.2	117.2		
2462.00	106.1	Fund/Peak	0	1.2	h	28.1	3.4	35.2	102.4		
2462.00	111.8	Fund/Ave.	0	1.6	v	28.1	3.4	35.2	108.1		
2462.00	97.2	Fund/Ave.	0	1.2	h	28.1	3.4	35.2	93.5		
3065.87	53.7	Ave.	0	1.5	v	30.3	4.0	35.2	52.8	54	-1.2
3065.87	49.3	Ave.	0	1.5	h	30.3	4.0	35.2	48.4	54	-5.6
2483.50	51.3	Ave.	0	1.5	v	28.1	3.4	35.5	47.3	54	-6.7
3065.87	63.8	Peak	0	1.5	v	30.3	4.0	35.2	62.9	74	-11.1
2483.50	63.2	Peak	0	1.5	v	28.1	3.4	35.5	59.2	74	-14.8
3065.87	59.5	Peak	0	1.5	h	30.3	4.0	35.2	58.6	74	-15.4
4924.00	34.1	Ave.	60	1.5	v	32.5	4.9	34.6	36.9	54	-17.1
4924.00	32.8	Ave.	0	1.2	h	32.5	4.9	34.6	35.6	54	-18.4
2483.50	35.6	Ave.	0	1.6	h	28.1	3.4	35.5	31.6	54	-22.4
4924.00	44.5	Peak	60	1.5	v	32.5	4.9	34.6	47.3	74	-26.7
4924.00	43.2	Peak	0	1.2	h	32.5	4.9	34.6	46.0	74	-28.0
2483.50	47.4	Peak	0	1.6	h	28.1	3.4	35.5	43.4	74	-30.6

Note:

- 1) FUND = Fundamental
- 2) AVG = average
- 3) The EUT reduced 4 dB for TX power at ch. 1.
- 4) The level is too low to be tested for third harmonic and above.

Unintentional Emission

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart B	
Frequency MHz	Ampl. dB μ V/m	Direction Degree	Height Meter	Polar H/V	Antenna dB	Cable Loss dB	Amp. dB	Corr. Ampl. dB μ V/m	Limit dB μ V/m	Margin dB
396.02	53.7	180	1.2	h	16.4	2.5	27.3	45.3	46	-0.7
132.01	54.2	210	1.5	v	12.2	1.6	27.9	40.1	43.5	-3.4
264.02	52.8	180	1.8	h	13.4	2.2	26.9	41.5	46	-4.5
115.20	51.7	180	1.2	v	11.8	1.6	27.7	37.4	43.5	-6.1
228.87	46.5	270	1.6	h	12.6	2.2	27.3	34.0	46	-12.0
245.21	37.9	120	1.2	v	13.3	2.2	27.2	26.2	46	-19.8