

Certification Test Report

FCC ID: IHDT56LN1

FCC Rule Part: CFR Part 24 Subpart E

ACS Report Number: 10-2044.W04.11.A

Applicant: Motorola
Model: WX415

Test Begin Date: 5-20-2010
Test End Date: 5-21-2010

Report Issue Date: 5-24-2010



FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 200897-0

This report is not be used to claim certification, approval, or endorsement by NVLAP, NIST or any government agency.

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This report contains 17 pages

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1.0 GENERAL

1.1 Purpose

The purpose of this report is to demonstrate compliance with Part 2 Subpart J and Part 24 Subpart E of the FCC's Code of Federal Regulations for a Class II Permissive Change.

1.2 Product Description

CDMA Cellular Phone with CDMA 1900 and Bluetooth signaling capabilities.

Manufacturer Information:
FIH, S&B Industry, Inc.
South Florida Design Center
1551 Sawgrass Corporate Parkway Suite 300
Sunrise, FL 33323

Contact: Jeff Wingfield
Phone: 954-931-0484
Email: jeff.wingfield@foxconn.com

Test Sample Serial Numbers: M7AJDL125V

Test Sample Condition: The unit tested was a production unit, provided in good physical condition with no noticeable functional defects.

1.3 Test Configurations and Justification

CDMA 1900 testing was performed for a Class II permissive change. The equipment under test (EUT) was evaluated for RF Spurious Emissions at the Antenna Terminal and for Field Strength of Spurious Emissions up to the 10th harmonic of the fundamental frequency. The evaluation was performed with the unit transmitting at maximum power while communicating with an Agilent 8960 Wireless Communications Test Set. The unit was pre-scanned in three orthogonal orientations and final measurements were performed in the orientation leading to the maximum emissions.

1.4 Emission Designators

The WX415 CDMA 1900 transmitter produces 1 distinct modulation format. The emissions designators for the modulation types used by the WX415 CDMA 1900 transmitter are as follows:

EMISSIONS DESIGNATORS:

CDMA 1900: 1M31F9W

2.0 TEST FACILITIES

2.1 Location

The radiated and conducted emissions test sites are located at the following address:

Advanced Compliance Solutions, Inc.
3998 FAU Blvd, Suite 310
Boca Raton, Florida 33431
Phone: (561) 961-5585
Fax: (561) 961-5587
www.acstestlab.com

FCC Test Firm Registration #: 581606
Industry Canada Lab Code: 4175C

2.2 Laboratory Accreditations/Recognitions/Certifications

ACS is accredited to ISO/IEC 17025 by the National Institute of Standards and Technology under their National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 200897-0. Unless otherwise specified, all tests methods described within this report are covered under the ISO/IEC 17025 scope of accreditation.

2.3 Radiated & Conducted Emissions Test Site Description

2.3.1 Semi-Anechoic Chamber Test Site

The EMC radiated test facility consists of an RF-shielded enclosure. The interior dimensions of the indoor semi-anechoic chamber are approximately 48 feet (14.6 m) long by 36 feet (10.8 m) wide by 24 feet (7.3 m) high and consist of rigid, 1/8 inch (0.32 cm) steel-clad, wood core modular panels with steel framing. In the shielded enclosure, the faces of the panels are galvanized and the chamber is self-supporting. 8-foot RF absorbing cones are installed on 4 walls and the ceiling. The steel-clad ground plane is covered with vinyl floor.

The turntable is driven by a pneumatic motor, which is capable of supporting a 2000-lb load. The turntable is flushed with the chamber floor which it is connected to, around its circumference, with a continuous metallic loaded spring. An EMCO Model 1051 Multi-device Controller controls the turntable position.

A pneumatic motor is used to control antenna polarizations and height relative to the ground. The height information is displayed on the control unit EMCO Model 1050.

The control room is an RF shielded enclosure attached to the semi-anechoic chamber with two bulkhead panels for connecting RF, and control cables. The dimension of the room is 7.3 m x 4.9 m x 3 m high and the entrance doors of both control and conducted rooms are 3 feet (0.91 m) by 7 feet (2.13 m).

A diagram of the Semi-Anechoic Chamber Test Site is shown in Figure 2.3.1-1 below:

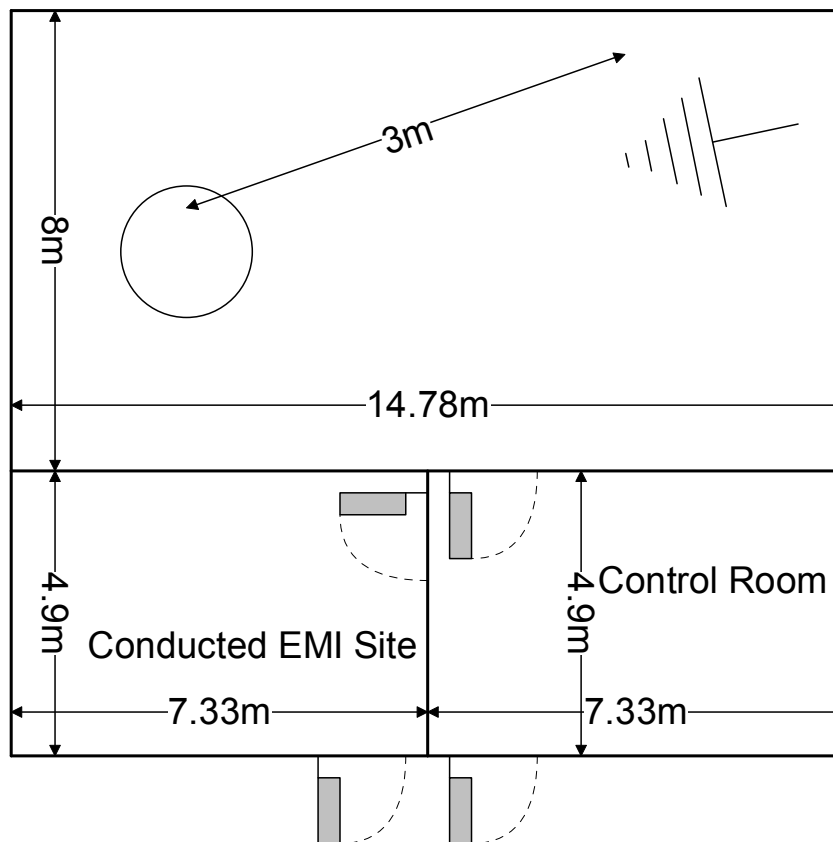


Figure 2.3.1-1: Semi-Anechoic Chamber Test Site

2.3.2 Conducted Emissions Test Site Description

The dimensions of the shielded conducted room are 7.3 x 4.9 x 3 m³. As per ANSI C63.4 2003 requirements, the data were taken using two LISNs; a Solar Model 8028-50 50 Ω/50 μH and an EMCO Model 3825. For 220 V, 50 Hz, a Polarad LISN (S/N 879341/048) is used in conjunction with a 1 kVA, 220 V ELGAR Model 1001B variable frequency generator set to 50 Hz, to filter the conducted noise from the generator.

A diagram of the room is shown below in figure 2.3.2-1:

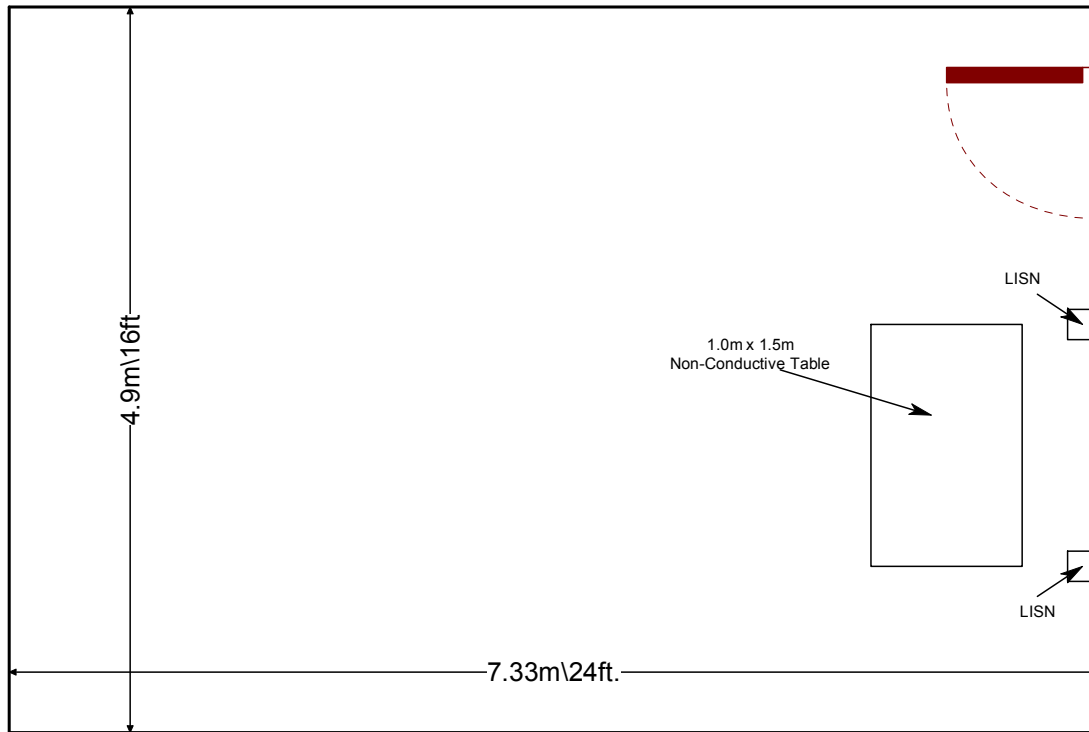


Figure 2.3.2-1: AC Mains Conducted EMI Site

3.0 APPLICABLE STANDARD REFERENCES

The following standards were used:

- 1 - ANSI C63.4-2003: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the 9 kHz to 40 GHz - 2003
- 2 -US Code of Federal Regulations (CFR): Title 47, Part 2, Subpart J: Equipment Authorization Procedures - 2010
- 3 - US Code of Federal Regulations (CFR): Title 47, Part 24, Subpart E: Broadband PCS - 2010
- 4 – TIA-603-C: Land Mobile FM or PM - Communications Equipment - Measurement and Performance Standards – 2004

4.0 LIST OF TEST EQUIPMENT

The calibration interval of test equipment is annually or the manufacturer's recommendations. Where the calibration interval deviates from the annual cycle based on the instrument manufacturer's recommendations, it shall be stated below.

Table 4-1: Test Equipment

AssetID	Manufacturer	Model #	Equipment Type	Serial #	Cal Due Date
2006	EMCO	3115	Antennas	2573	2/21/2011
2007	EMCO	3115	Antennas	2419	1/12/2012
2008	COM-Power	AH-826	Antennas	81009	N/A
2012	Hewlett-Packard	HP83017A	Amplifier	3123A00324	12/30/2010
2013	Hewlett Packard	HP8566B	Spectrum Analyzers	2407A03233	8/7/2010
2014	Hewlett Packard	HP 85650A	Quasi Peak Adapter	2430A00559	8/7/2010
2037	ACS Boca	Chamber EMI Cable Set	Cable Set	2037	12/30/2010
RE563	Hewlett Packard	8673D	Signal Generators	3034A01078	N/A
2044	QMI	N/A	Cables	2044	1/6/6011
N/A	Narda	4226-20	20 dB Directional Coupler	N/A	N/A
N/A	Mini-Circuits	VHF-3100+	High Pass Filter	30737	N/A
N/A	Mini-Circuits	VHF-8400+	High Pass Filter	30752	N/A

5.0 SUPPORT EQUIPMENT

For the radiated spurious emissions measurements, the radio was tested stand alone. Hence, there is no support equipment to be reported in Table 5.1.

Table 5-1: Support Equipment

Diagram #	Manufacturer	Equipment Type	Model Number	Serial Number	FCC ID
1					NA

6.0 EQUIPMENT UNDER TEST SETUP AND BLOCK DIAGRAM

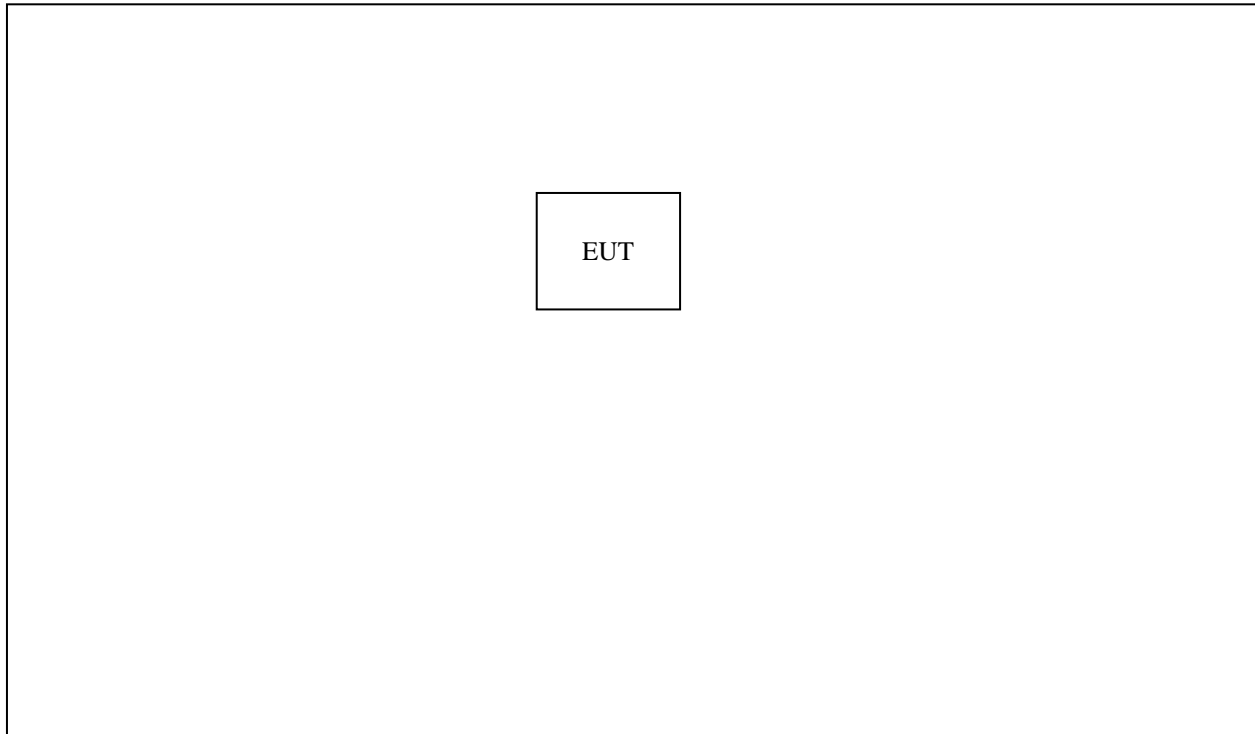


Figure 6-1: EUT Test Setup

7.0 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Spurious Emissions at Antenna Terminals – FCC Part 2.1051, Part 24.238 (a)

7.1.1 Measurement Procedure

The RF output of the equipment under test was connected to the input of the Spectrum Analyzer using a 20 dB directional coupler, where the coupling port was connected to the Agilent 8960 Wireless Communications Test Set. The spectrum analyzer resolution bandwidth was set to 30 kHz below 1000 MHz and 1 MHz above 1000 MHz. Correction factors were employed to correct for any losses. The spectrum was investigated in accordance to CFR 47 Part 2.1057. Results are shown below in Tables 7.1.2-1 to 7.1.2-3.

7.1.2 Measurement Results

Table 7.1.2-1: Spurious Emissions at Antenna Terminals – 1851.25 MHz – CDMA TX Mode

Frequency (MHz)	Spurious Level (dBm)	Limit (dBm)	Margin to Limit (dB)
3702.50	-20.76	-13.00	7.76
5553.75	-25.28	-13.00	12.28
7405.00	*	-13.00	*
9256.25	*	-13.00	*
11107.50	*	-13.00	*
12958.75	*	-13.00	*
14810.00	*	-13.00	*
16661.25	*	-13.00	*
18512.50	*	-13.00	*

NOTE: All the emissions not listed could not be detected above the measurement equipment noise floor or were attenuated by more than 20 dB below the limit.

Table 7.1.2-2: Spurious Emissions at Antenna Terminals – 1880 MHz – CDMA TX Mode

Frequency (MHz)	Spurious Level (dBm)	Limit (dBm)	Margin to Limit (dB)
3760.00	-16.19	-13.00	3.19
5640.00	*	-13.00	*
7520.00	*	-13.00	*
9400.00	*	-13.00	*
11280.00	*	-13.00	*
13160.00	*	-13.00	*
15040.00	*	-13.00	*
16920.00	*	-13.00	*
18800.00	*	-13.00	*

NOTE: All the emissions not listed could not be detected above the measurement equipment noise floor or were attenuated by more than 20 dB below the limit.

Table 7.1.2-3: Spurious Emissions at Antenna Terminals – 1908.75 MHz – CDMA TX Mode

Frequency (MHz)	Spurious Level (dBm)	Limit (dBm)	Margin to Limit (dB)
3817.50	-21.17	-13.00	8.17
5726.25	-29.06	-13.00	16.06
7635.00	*	-13.00	*
9543.75	*	-13.00	*
11452.50	*	-13.00	*
13361.25	*	-13.00	*
15270.00	*	-13.00	*
17178.75	*	-13.00	*
19087.50	*	-13.00	*

NOTE: All the emissions not listed could not be detected above the measurement equipment noise floor or were attenuated by more than 20 dB below the limit.

7.2 Field Strength of Spurious Emissions – FCC Part 2.1053, Part 24.238 (a)

7.2.1 Measurement Procedure

The equipment under test is placed in the Semi-Anechoic Chamber (described in section 2.3.1) on a wooden table at the turntable center. For each spurious emission, the antenna mast is raised and lowered from one (1) to four (4) meters and the turntable is rotated 360° and the maximum reading on the spectrum analyzer is recorded. This was repeated for both horizontal and vertical polarizations of the receive antenna.

The equipment under test is then replaced with a substitution antenna fed by a signal generator. The signal generator’s frequency is set to that of the spurious emission recorded from the equipment under test. The antenna mast is raised and lowered from one (1) to four (4) meters to obtain a maximum reading on the spectrum analyzer. The output of the signal generator is then adjusted until the reading on the spectrum analyzer matches that obtained from the equipment under test. The signal generator level is recorded. The power in dBm of each spurious emission is calculated by correcting the signal generator level for the cable loss and gain of the substitution antenna referenced to a dipole. The spectrum was investigated in accordance to CFR 47 Part 2.1057.

The magnitude of all spurious emissions not reported were attenuated below the noise floor of the measurement system and therefore not specified in this report. Results are shown below in Figures 7.4.2-1 through 7.4.2-3.

7.2.2 Measurement Results

Table 7.2.2-1: Field Strength of Spurious Emissions – 1851.25 MHz – TX CDMA Mode

Frequency (MHz)	Reading (dBm)	Polarization (H/V)	Spurious Level (dBm)	Limit (dBm)	Margin to Limit (dB)
3702.50	-44.84	H	-27.78	-13.00	14.78
5553.75	*	H	*	-13.00	*
7405.00	*	H	*	-13.00	*
9256.25	*	H	*	-13.00	*
11107.50	*	H	*	-13.00	*
12958.75	*	H	*	-13.00	*
14810.00	*	H	*	-13.00	*
16661.25	*	H	*	-13.00	*
18512.50	*	H	*	-13.00	*
<hr/>					
3702.50	-41.63	V	-24.19	-13.00	11.19
5553.75	*	V	*	-13.00	*
7405.00	*	V	*	-13.00	*
9256.25	*	V	*	-13.00	*
11107.50	*	V	*	-13.00	*
12958.75	*	V	*	-13.00	*
14810.00	*	V	*	-13.00	*
16661.25	*	V	*	-13.00	*
18512.50	*	V	*	-13.00	*

NOTE: All the emissions not listed could not be detected above the measurement equipment noise floor or were attenuated by more than 20 dB below the limit.

Table 7.2.2-2: Field Strength of Spurious Emissions – 1880 MHz – TX CDMA Mode

Frequency (MHz)	Reading (dBm)	Polarization (H/V)	Spurious Level (dBm)	Limit (dBm)	Margin to Limit (dB)
3760.00	-43.52	H	-26.89	-13.00	13.89
5640.00	*	H	*	-13.00	*
7520.00	*	H	*	-13.00	*
9400.00	*	H	*	-13.00	*
11280.00	*	H	*	-13.00	*
13160.00	*	H	*	-13.00	*
15040.00	*	H	*	-13.00	*
16920.00	*	H	*	-13.00	*
18800.00	*	H	*	-13.00	*
3760.00	-36.4	V	-19.49	-13.00	6.49
5640.00	*	V	*	-13.00	*
7520.00	*	V	*	-13.00	*
9400.00	*	V	*	-13.00	*
11280.00	*	V	*	-13.00	*
13160.00	*	V	*	-13.00	*
15040.00	*	V	*	-13.00	*
16920.00	*	V	*	-13.00	*
18800.00	*	V	*	-13.00	*

NOTE: All the emissions not listed could not be detected above the measurement equipment noise floor or were attenuated by more than 20 dB below the limit.

Table 7.2.2-3: Field Strength of Spurious Emissions – 1908.75 MHz – TX CDMA Mode

Frequency (MHz)	Reading (dBm)	Polarization (H/V)	Spurious Level (dBm)	Limit (dBm)	Margin to Limit (dB)
3817.50	-43.9	H	-26.43	-13.00	13.43
5726.25	*	H	*	-13.00	*
7635.00	*	H	*	-13.00	*
9543.75	*	H	*	-13.00	*
11452.50	*	H	*	-13.00	*
13361.25	*	H	*	-13.00	*
15270.00	*	H	*	-13.00	*
17178.75	*	H	*	-13.00	*
19087.50	*	H	*	-13.00	*
3817.50	-38.16	V	-21.23	-13.00	8.23
5726.25	*	V	*	-13.00	*
7635.00	*	V	*	-13.00	*
9543.75	*	V	*	-13.00	*
11452.50	*	V	*	-13.00	*
13361.25	*	V	*	-13.00	*
15270.00	*	V	*	-13.00	*
17178.75	*	V	*	-13.00	*
19087.50	*	V	*	-13.00	*

NOTE: All the emissions not listed could not be detected above the measurement equipment noise floor or were attenuated by more than 20 dB below the limit.

7.3 Radiated Emissions (Unintentional Radiators/Receiver)

7.3.1 Measurement Procedure

Radiated emissions tests were performed up to 20GHz. Measurements of the radiated field strength were made at a distance of 3m from the boundary of the equipment under test (EUT) and the receiving antenna. The antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. Radiated measurements above 30MHz and below 1GHz were made with the Spectrum Analyzer’s resolution bandwidth set to 120 KHz using a Quasi-peak detector. Above 1GHz, peak and average measurements are taken with the RBW and VBW were set to 1MHz and 3MHz respectively. This was repeated for both horizontal and vertical polarizations of the receive antenna.

The field strength of each radiated emission is calculated by correcting the EMI receiver level for cable loss, amplifier gain, and antenna correction factors.

$$\text{Field Strength (dBuV/m)} = \text{EMI Receiver Level (dBuV)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)} + \text{Antenna Correction Factor (1/m)}$$

Results of the test are shown below in Table 7.6.2-1 to Table 7.6.2-3.

7.3.2 Measurement Results

Part 15.109

Table 7.6.2-1: Radiated Emissions Tabulated Data for RX=1931.25 MHz

Frequency (MHz)	Measured Level (dBuV)		Ant. Pol. (H/V)	Corr. Factors (dB)	Corrected Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	
	Pk	Qpk/Av			Pk	Qpk/Av		Pk	Qpk/Av
1931.25	*	*	H	*	*	*	54.00	*	*
3862.50	43.33	35.04	H	-3.72	47.05	38.76	54.00	6.95	15.24
5793.75	*	*	H	*	*	*	54.00	*	*
7725.00	*	*	H	*	*	*	54.00	*	*
9656.25	*	*	H	*	*	*	54.00	*	*
11587.50	*	*	H	*	*	*	54.00	*	*
13518.75	*	*	H	*	*	*	54.00	*	*
15450.00	*	*	H	*	*	*	54.00	*	*
17381.25	*	*	H	*	*	*	54.00	*	*
19312.50	*	*	H	*	*	*	54.00	*	*
1931.25	*	*	V	*	*	*	54.00	*	*
3862.50	45.74	40.02	V	-3.72	49.46	43.74	54.00	4.54	10.26
5793.75	*	*	V	*	*	*	54.00	*	*
7725.00	*	*	V	*	*	*	54.00	*	*
9656.25	*	*	V	*	*	*	54.00	*	*
11587.50	*	*	V	*	*	*	54.00	*	*
13518.75	*	*	V	*	*	*	54.00	*	*
15450.00	*	*	V	*	*	*	54.00	*	*
17381.25	*	*	V	*	*	*	54.00	*	*
19312.50	*	*	V	*	*	*	54.00	*	*

NOTE: All the emissions not listed could not be detected above the measurement equipment noise floor or were attenuated by more than 20 dB below the limit.

Table 7.6.2-2: Radiated Emissions Tabulated Data for RX=1960 MHz

Frequency (MHz)	Measured Level (dBuV)		Ant. Pol. (H/V)	Corr. Factors (dB)	Corrected Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	
	Pk	Qpk/Av			Pk	Qpk/Av		Pk	Qpk/Av
1960.00	*	*	H	*	*	*	54.00	*	*
3920.00	43.96	30.41	H	-3.80	47.76	34.21	54.00	6.24	19.79
5880.00	*	*	H	*	*	*	54.00	*	*
7840.00	*	*	H	*	*	*	54.00	*	*
9800.00	*	*	H	*	*	*	54.00	*	*
11760.00	*	*	H	*	*	*	54.00	*	*
13720.00	*	*	H	*	*	*	54.00	*	*
15680.00	*	*	H	*	*	*	54.00	*	*
17640.00	*	*	H	*	*	*	54.00	*	*
19600.00	*	*	H	*	*	*	54.00	*	*
1960.00	*	*	V	*	*	*	54.00	*	*
3920.00	46.22	41.24	V	-3.80	50.02	45.04	54.00	3.98	8.96
5880.00	*	*	V	*	*	*	54.00	*	*
7840.00	*	*	V	*	*	*	54.00	*	*
9800.00	*	*	V	*	*	*	54.00	*	*
11760.00	*	*	V	*	*	*	54.00	*	*
13720.00	*	*	V	*	*	*	54.00	*	*
15680.00	*	*	V	*	*	*	54.00	*	*
17640.00	*	*	V	*	*	*	54.00	*	*
19600.00	*	*	V	*	*	*	54.00	*	*

NOTE: All the emissions not listed could not be detected above the measurement equipment noise floor or were attenuated by more than 20 dB below the limit.

Table 7.6.2-3: Radiated Emissions Tabulated Data for RX=1988.75 MHz

Frequency (MHz)	Measured Level (dBuV)		Ant. Pol. (H/V)	Corr. Factors (dB)	Corrected Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	
	Pk	Qpk/Av			Pk	Qpk/Av		Pk	Qpk/Av
1988.75	*	*	H	*	*	*	54.00	*	*
3977.50	44.00	32.27	H	-3.92	47.92	36.19	54.00	6.08	17.81
5966.25	*	*	H	*	*	*	54.00	*	*
7955.00	*	*	H	*	*	*	54.00	*	*
9943.75	*	*	H	*	*	*	54.00	*	*
11932.50	*	*	H	*	*	*	54.00	*	*
13921.25	*	*	H	*	*	*	54.00	*	*
15910.00	*	*	H	*	*	*	54.00	*	*
17898.75	*	*	H	*	*	*	54.00	*	*
19887.50	*	*	H	*	*	*	54.00	*	*
1988.75	*	*	V	*	*	*	54.00	*	*
3977.50	45.69	35.07	V	-3.92	49.61	38.99	54.00	4.39	15.01
5966.25	*	*	V	*	*	*	54.00	*	*
7955.00	*	*	V	*	*	*	54.00	*	*
9943.75	*	*	V	*	*	*	54.00	*	*
11932.50	*	*	V	*	*	*	54.00	*	*
13921.25	*	*	V	*	*	*	54.00	*	*
15910.00	*	*	V	*	*	*	54.00	*	*
17898.75	*	*	V	*	*	*	54.00	*	*
19887.50	*	*	V	*	*	*	54.00	*	*

NOTE: All the emissions not listed could not be detected above the measurement equipment noise floor or were attenuated by more than 20 dB below the limit.

8.0 CONCLUSION

In the opinion of ACS, Inc. the model WX415, manufactured by FIH, S&B Industry, Inc, meets all the requirements of FCC Part 24 as applicable.

End Report