



Engineering Solutions & Electromagnetic Compatibility Services

FCC Part 15.247 Intentional Radiated Emissions Test Report

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FCC ID: IC:	CFS8DL6280ZW 573F-6280ZW	Test Report Date	January 20, 2012
Platform	N/A	RTL Work Order Number	2012004
Model #	6280ZW	RTL Quote Number	QRTL12-004
American National Standard Institute	ANSI C63.4-2003: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz		
American National Standard Institute	ANSI C63.10-2009: American National Standard for Testing Unlicensed Wireless Devices		
FCC Classification	DTS – Part 15 Digital Transmission System		
FCC Rule Part(s)	FCC Rules Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System (10-01-10) (Guidance per DA 00-705)		

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15 and, ANSI C63.4.

Signature: 

Date: January 20, 2012

Typed/Printed Name: Desmond A. Fraser

Position: President

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These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1445.

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1 General Information

1.1 Scope

Applicable Standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.

This test report addresses the intentional radiated emissions requirements per FCC 15.247, which are the harmonic/spurious radiated emissions occurring in the restricted bands per FCC 15.205 (against the FCC 15.209 limits). Additionally, radiated field strength measurements are provided for the low and high channels for use with the conducted delta plots provided in a separate report filed with this application.

1.2 Description of EUT

Equipment Under Test	6280ZW
Power Supply	12VDC AC Adapter
Modulation Type	DSSS
Frequency Range	2412 – 2462 MHz
Antenna Connector Type	PCB
Antenna Types	Trace

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.4 Modifications

No modifications were required for compliance.

2 Test Information

2.1 Description of Test Modes

In accordance with FCC 15.31(m), and because the EUT utilizes an operating band greater than 10 MHz, the following frequencies were tested:

Table 2-1: Frequencies Tested

Channel	Frequency
Low	2412
Mid	2437
High	2462

2.2 Exercising the EUT

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that information was being transmitted. There were no deviations from the test standard(s) and/or methods. The test results reported relate only to the item tested.

2.3 Test Result Summary

Table 2-2: Test Result Summary – FCC Part 15, Subpart C (Section 15.247)

FCC Reference	C63.10 Procedure	Test	Pass/Fail or N/A
FCC 15.209	6.5, 6.6	Radiated Emissions	Pass

2.4 Related Submittal(s)/Grant(s)

This report is to support an application for certification under FCC ID: CFS8DL6280ZW, IC: 573F-6280ZW.

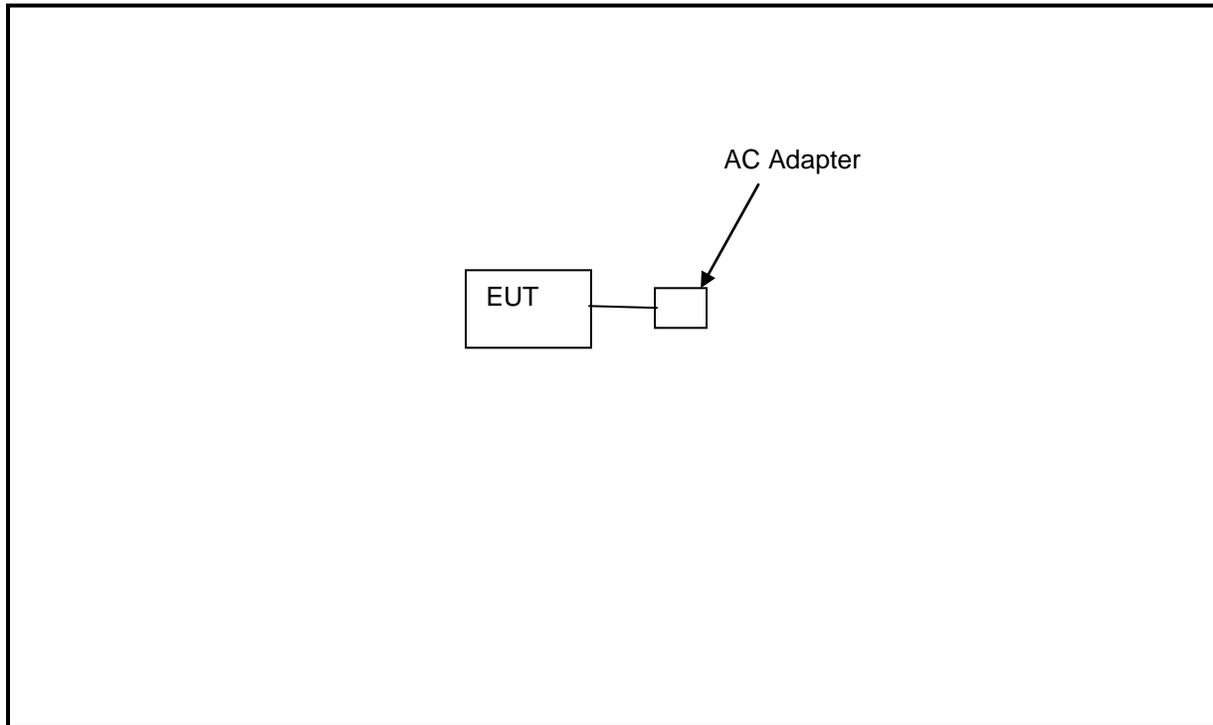
2.5 Test System Details

The test samples were received on January 16, 2012. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following tables.

Table 2-3: Equipment Under Test

Part	Manufacturer	Model #	Serial Number	FCC ID	RTL Bar Code
6280ZW	Honeywell International	6280ZW	00D02D1DFB50	CFS8DL6280ZW	20527
AC Adapter	ME Electronics	MGT-121-AR	N/A	N/A	20528

2.6 Configuration of Tested System



3 Radiated Emissions – FCC 15.209

3.1 Limits of Radiated Emissions Measurement

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009-0.490	2400/f (kHz)	300
0.490-1.705	2400/f (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any circumstances of modulation.

3.2 Radiated Emissions Measurement Test Procedure

Procedure: C63.10-2009 6.5, 6.6

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10th harmonic of the highest fundamental transmitter frequency (24.8 GHz).

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1,000 MHz, emissions are measured using the average detector function with a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Table 3-1: Radiated Emissions Test Equipment

RTL Bar Code	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	9/13/12
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	9/13/12
900932	Hewlett Packard	8449B	Amplifier (1 – 26.5 GHz)	3008A00505	7/14/12
901516	Insulated Wire Inc.	KPS-1503-2400-KPS	RF cable, 20'	NA	10/14/12
901517	Insulated Wire Inc.	KPS-1503-360-KPS	RF cable 36"	901262	10/14/12
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	6/14/12
900321	EMCO	3161-03	Horn Antennas (4 – 8.2 GHz)	9508-1020	6/14/12
900323	EMCO	3160-07	Horn Antennas (8.2 – 12.4 GHz)	9605-1054	6/14/12
900356	EMCO	3160-08	Horn Antennas (12.4 – 18 GHz)	9607-1044	6/14/12
901218	EMCO	3160-09	Horn Antenna (18 - 26.5 GHz)	960281-003	6/19/12
900392	Hewlett Packard	1197OK	Harmonic Mixer (18 – 26.5 GHz)	3525A00159	11/27/12

3.3 Radiated Emissions Test Results

3.3.1 Radiated Emissions Harmonics/Spurious

Table 3-2: 2412 MHz; 802.11b; 11 mbps; Channel 1; Average Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/10 Hz VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Average Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2412.000	72.0	25.0	97.0	Fundamental	
4824.000	15.8	12.6	28.4	54.0	-25.6
12060.000	20.9	17.6	38.5	54.0	-15.5
14472.000	19.5	22.4	41.9	54.0	-12.1
19296.000	14.9	26.8	41.7	54.0	-12.3

Table 3-3: 2437 MHz; 802.11b; 11 mbps; Channel 6; Average Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/10 Hz VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Average Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.000	20.1	12.6	32.7	54.0	-21.3
7311.000	19.2	12.9	32.1	54.0	-21.9
12185.000	19.3	17.5	36.8	54.0	-17.2
19496.000	16.9	26.5	43.4	54.0	-10.6

Table 3-4: 2462 MHz; 802.11b; 11 mbps; Channel 11; Average Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/10 Hz VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Average Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2462.000	72.9	25.0	97.9	Fundamental	
4924.000	19.4	12.6	31.9	54.0	-22.1
7386.000	19.2	12.8	31.9	54.0	-22.1
12310.000	19.7	17.5	37.2	54.0	-16.8
19696.000	17.0	26.7	43.8	54.0	-10.2
22158.000	13.3	32.9	46.2	54.0	-7.8
24620.000	12.0	32.0	44.0	54.0	-10.0

Table 3-5: 2412 MHz; 802.11g; 54 mbps; Channel 1; Average Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/10 Hz VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Average Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2412.000	69.4	25.0	94.4	Fundamental	
4824.000	16.6	12.6	29.2	54.0	-24.8
12060.000	20.6	17.6	38.2	54.0	-15.8
14472.000	19.8	22.4	42.2	54.0	-11.8
19296.000	14.8	26.8	41.6	54.0	-12.4

Table 3-6: 2437 MHz; 802.11g; 54 mbps; Channel 6; Average Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/10 Hz VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Average Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.000	20.5	12.6	33.1	54.0	-20.9
7311.000	19.8	12.9	32.7	54.0	-21.3
12185.000	19.7	17.5	37.2	54.0	-16.8
19496.000	16.9	26.5	43.4	54.0	-10.6

Table 3-7: 2462 MHz; 802.11g; 54 mbps; Channel 11; Average Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/10 Hz VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Average Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2462.000	70.7	25.0	95.7	Fundamental	
4924.000	19.4	12.6	31.9	54.0	-22.1
7386.000	19.2	12.8	31.9	54.0	-22.1
12310.000	19.6	17.5	37.1	54.0	-16.9
19696.000	17.1	26.7	43.8	54.0	-10.2
22158.000	12.0	32.9	44.9	54.0	-9.1
24620.000	11.9	32.0	43.9	54.0	-10.1

Table 3-8: 2412 MHz; 802.11b; 11 mbps; Channel 1; Peak Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Peak Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2412.000	81.3	25.0	106.3	Fundamental	
4824.000	35.9	12.6	48.5	74.0	-25.5
12060.000	32.5	17.6	50.1	74.0	-23.9
14472.000	32.5	22.4	54.9	74.0	-19.1
19296.000	26.0	26.8	52.8	74.0	-21.2

Table 3-9: 2437 MHz; 802.11b; 11 mbps; Channel 6; Peak Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Peak Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.000	32.6	12.6	45.2	74.0	-28.8
7311.000	32.5	12.9	45.4	74.0	-28.6
12185.000	31.9	17.5	49.4	74.0	-24.6
19496.000	30.4	26.5	56.9	74.0	-17.1

Table 3-10: 2462 MHz; 802.11b; 11 mbps; Channel 11; Peak Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Peak Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2462.000	81.9	25.0	106.9	Fundamental	
4924.000	32.1	12.6	44.6	74.0	-29.4
7386.000	31.9	12.8	44.6	74.0	-29.4
12310.000	31.8	17.5	49.3	74.0	-24.7
19696.000	30.0	26.7	56.8	74.0	-17.2
22158.000	25.5	32.9	58.4	74.0	-15.6
24620.000	24.3	32.0	56.3	74.0	-17.7

Table 3-11: 2412 MHz; 802.11g; 54 mbps; Channel 1; Peak Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Peak Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2412.000	82.8	25.0	107.8	Fundamental	
4824.000	34.5	12.6	47.1	74.0	-26.9
12060.000	32.9	17.6	50.5	74.0	-23.5
14472.000	32.5	22.4	54.9	74.0	-19.1
19296.000	25.9	26.8	52.7	74.0	-21.3

Table 3-12: 2437 MHz; 802.11g; 54 mbps; Channel 6; Peak Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Peak Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4874.000	33.6	12.6	46.2	74.0	-27.8
7311.000	33.9	12.9	46.8	74.0	-27.2
12185.000	31.9	17.5	49.4	74.0	-24.6
19496.000	30.6	26.5	57.1	74.0	-16.9

Table 3-13: 2462 MHz; 802.11g; 54 mbps; Channel 11; Peak Mode

Frequency (MHz)	Spectrum Analyzer Average Level (1 MHz RBW/VBW) (dBuV)	Site Correction Factor (dB/m)	Corrected Peak Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2462.000	82.4	25.0	107.4	Fundamental	
4924.000	32.1	12.6	44.6	74.0	-29.4
7386.000	31.6	12.8	44.3	74.0	-29.7
12310.000	31.6	17.5	49.1	74.0	-24.9
19696.000	30.0	26.7	56.7	74.0	-17.3
22158.000	24.9	32.9	57.8	74.0	-16.2
24620.000	24.2	32.0	56.2	74.0	-17.8

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Client: Honeywell International
Model #: 6280ZW
Standard: FCC 15.247
ID's: CFS8DL6280ZW/573F-6280ZW
Report #: 2012004

Test Personnel:

Daniel W. Baltzell EMC Test Engineer	 Signature	January 19, 2012 Date of Test
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4 Conclusion

The data in this measurement report shows that the Honeywell International Model 6280ZW, FCC ID: CFS8DL6280ZW, IC: 573F-6280ZW, complies with the applicable intentional radiated requirements of Parts 2 and 15 of the FCC rules and regulations.