Engineering and Testing for EMC and Safety Compliance

CERTIFICATION APPLICATION REPORT
FCC PART 15.247 & INDUSTRY CANADA RSS-210

Test Lab:	Applicant:
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FCC ID / IC ID:	I28MD-ZLAN11B / 3798A-ZLAN11B	**TEST REPORT DATE:**	June 28, 2005
PLATFORM:	N/A	**RTL WORK ORDER #:**	2004207
MODEL:	ZLAN11B	**RTL QUOTE #:**	QRTL04-224

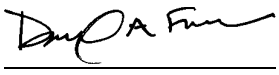
Standards and Procedures:	ANSI 63.4 and FCC 97-114 (DSSS)
FCC Classification:	DTS
FCC Rule Part:	Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System
Industry Canada Standard:	RSS-210: Low Power License-Exempt Radio Communication Devices (All Frequency Bands)
Digital Interface Information	Digital Interface was found to be compliant

Frequency Range (MHz)	Output Power*(W)	Frequency Tolerance	Emission Designator
2412-2462	0.045	N/A	17M5F1D

* output power is maximum peak conducted

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 or FCC Part 2, FCC Part 15, Industry Canada RSS-210, ANSI 63.4, and FCC 97-114 (DSSS).

Signature:  Date: June 28, 2005

Typed/Printed Name: Desmond A. Fraser Position: President

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1 GENERAL INFORMATION

1.1 SCOPE

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.

IC RSS-210 Section 6.2.2(o): 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.

1.2 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).

1.3 RELATED SUBMITTAL(S)/GRANT(S)

This is an original FCC certification application for Limited Modular transmitter approval per DA 00-1407 for Zebra Technologies Corp., Model Name: ZLAN11B, Model Number: AT17192-1, FCC ID: I28MD-ZLAN11B.

The applicant requests LIMITED MODULAR APPROVAL to allow the use of this radio in Zebra printers and other Zebra products similar in style to those presented in this report, including housing type and materials, and not limited to the printers in this report. Appendix E of this report includes a letter from the applicant justifying the LIMITED MODULAR APPROVAL request. The IF, LO and up to the 2nd LO were also investigated and tested.

With respect to Industry Canada, IC: 3798A-ZLAN11B the applicant requests MODULAR APPROVAL, based on RSS-210, Section 5.18. The application includes a letter from the applicant justifying Modular Approval under the conditions set forth in the RSS-210 standard.

1.4 MODIFICATIONS

No modifications were implemented to meet testing criteria.

2 TEST INFORMATION

2.1 TEST JUSTIFICATION

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. Channel 1 at 2412 MHz, Channel 6 at 2437 MHz, and Channel 11 at 2462 MHz were tested and investigated from 9 kHz to 24 GHz. Data for all three channels are presented in this report.

The EUT is connected to an external dipole antenna mounted in representative printers in which it will be used. This antenna transmits, receives, and is connected to the antenna port.

The worst case data taken in this report represents the highest data rate at 11 MBPS. Data rates of 5.5 MBPS, 2 MBPS and 1 MBPS were investigated and found to be in compliance. The change in envelope did not cause the EUT to be non-compliant in any of the aforementioned modes.

2.2 EXERCISING THE EUT

The EUT was provided with the software to continuously transmit during testing. The carrier was also checked to verify that the information was being transmitted. There were no deviations from the test standard(s) and/or methods.

2.3 TEST RESULT SUMMARY

TABLE 2-1: TEST RESULT SUMMARY WITH FCC RULES AND REGULATIONS

STANDARD	TEST	PASS/FAIL OR N/A
FCC 15.205	Compliance with the Restricted Band Edge	Pass
FCC 15.207	Conducted Emissions	Pass
FCC 15.209	Radiated Emissions	Pass
FCC 15.247(a)(2)	Modulated Bandwidth	Pass
FCC 15.247(b)	Power Output	Pass
FCC 15.247(c)	Antenna Conducted Spurious Emissions	Pass
FCC 15.247(d)	Power Spectral Density	Pass

2.4 TEST SYSTEM DETAILS

The test sample was received on January 24, 2005. The FCC Identifiers for all equipment, and descriptions of all cables used in the tested system, are shown in the following table.

TABLE 2-2: EQUIPMENT UNDER TEST (EUT)

Part	Manufacturer	Model #	Serial Number	FCC ID	Cable Description	RTL Bar Code
Wireless LAN Adapter (EUT)	DPAC	AT17192-1	10	I28MD-ZLAN11B	N/A	016459
Wireless LAN Adapter (EUT)	DPAC	AT17192-1	9	I28MD-ZLAN11B	N/A	016460
Wireless Printer	Zebra Technologies	QL-220	XXXX02-03-0019	N/A	0.2m shielded	016473
Wireless Printer	Zebra Technologies	QL-320	XXJK04-27-0002	N/A	N/A	016461
Wireless Printer	Zebra Technologies	QL-420	XXVT03-02-0016	N/A	0.2m shielded	016466
Wireless Printer	Zebra Technologies	RW-420	ALPHA-30-0024	N/A	0.2m shielded	016471
7.4 VDC Battery	Zebra Technologies	AT16004-1	N/A	N/A	N/A	016458
Battery Charger	Zebra Technologies	L172	N/A	N/A	2m shielded	016227

2.5 CONFIGURATION OF TESTED SYSTEM

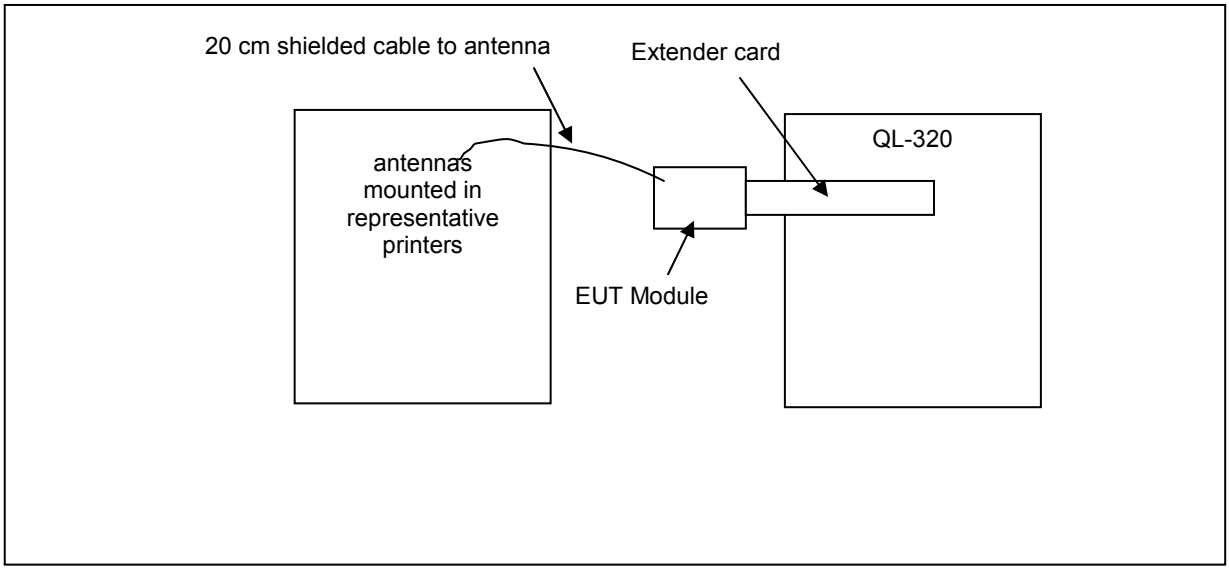


FIGURE 2-1: WORST CASE CONFIGURATION OF SYSTEM UNDER TEST

3 PEAK OUTPUT POWER - FCC §15.247(B)(1); IC RSS-210 §6.2.2(O)(B)

3.1 POWER OUTPUT TEST PROCEDURE

The conducted output power of the EUT was measured using an Agilent 4416A EPM-P Series Power Meter with an E9323A Peak and Average Power Sensor.

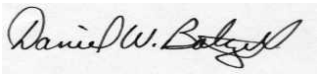
3.2 POWER OUTPUT TEST DATA

TABLE 3-1: POWER OUTPUT TEST DATA

CHANNEL	PEAK POWER CONDUCTED OUTPUT (dBm)
1	16.5
6	15.5
11	15.6

*Measurement accuracy is +/- 1.5 dB

TEST PERSONNEL:

Daniel W. Baltzell		February 5, 2005
Test Engineer	Signature	Date Of Test

3.3 POWER OUTPUT TEST EQUIPMENT

TABLE 3-2: POWER OUTPUT TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901356	Agilent Technologies	E9323A (50MHz-6GHz)	Peak & Average Power Sensor	31764-261	9/10/05
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	8/2/05

4 COMPLIANCE WITH THE RESTRICTED BAND EDGE - FCC §15.247(C), §15.205; IC RSS-210 §6.3

4.1 BAND EDGE TEST PROCEDURE

Compliance with the band edges was performed using the FCC's "Radiated Measurement at a Band Edge" guidance document. The final data derived below were from radiated measurements only. The data shown in this report represents the worst case at 11 MBPS. Data rates of 5.5 MBPS, 2 MBPS, and 1 MBPS were investigated and found to be in compliance.

4.2 RESTRICTED BAND EDGE PLOTS

Calculation of Lower Band Edge

The level 106.5 dBuV/m is the worst case average field strength measurement, from which the delta measurement of 52.8 dB is subtracted (reference plots), which is equivalent to a level of 53.7 dB. This level has a margin of 0.3 dB under the limit of 54 dBuV/m.

Calculation: 106.5 dBuV/m – 52.8 dB – 54 dBuV/m = -0.3 dB

QL220 WITH CQ17383-1 ANTENNA
Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 107.7 dBuV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 103.4 dBuV/m

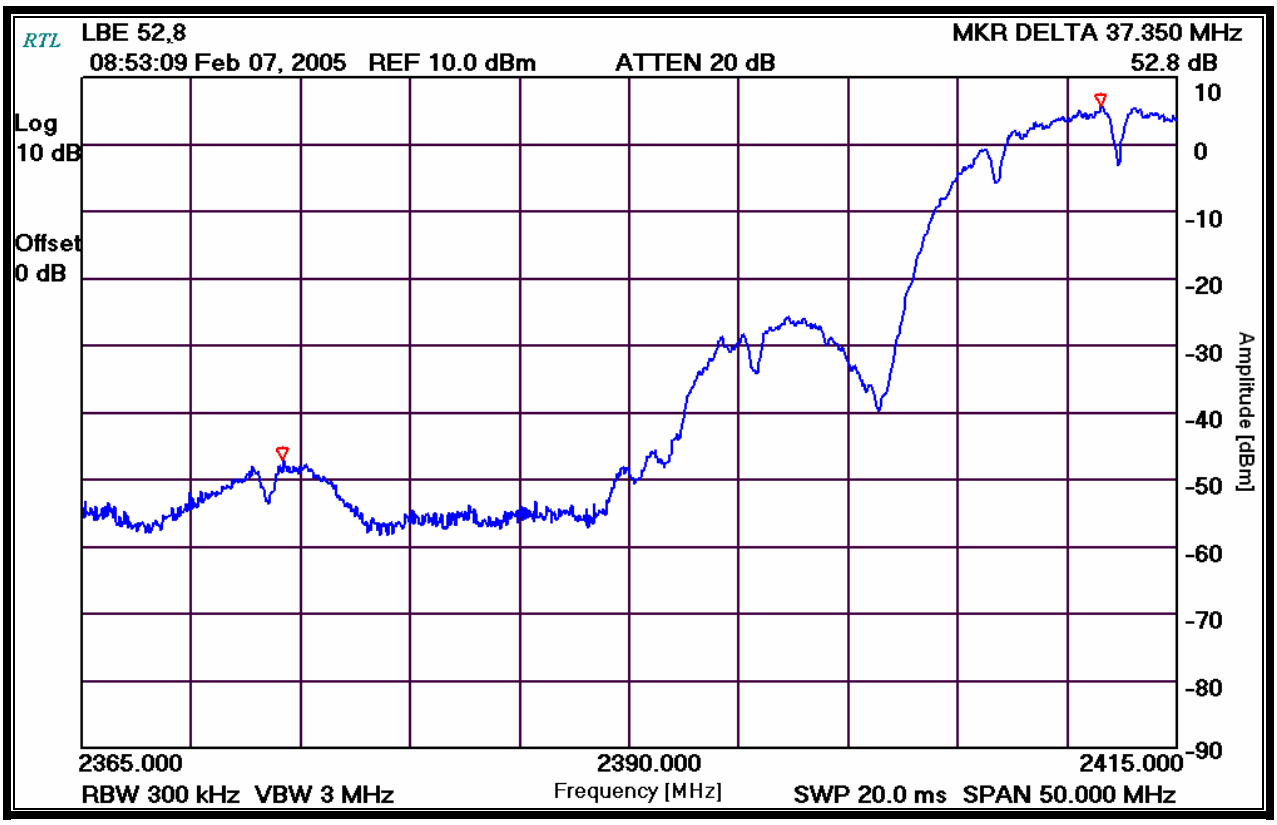
QL420 WITH CQ17383-1 ANTENNA
Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 111.2 dBuV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 106.5 dBuV/m

RW420 WITH CQ17383-1 ANTENNA
Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 106.0 dBuV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 101.0 dBuV/m

Delta measurement: 52.8 dB

Channel Number:	1
Frequency (MHz):	2412
Resolution Bandwidth (kHz):	300
Video Bandwidth (MHz):	3
Sweep Time (ms):	20

PLOT 4-1: LOWER BAND EDGE: DELTA MEASUREMENT



TEST PERSONNEL:

Daniel W. Baltzell		February 7, 2005
Test Engineer	Signature	Date Of Test

Calculation of Upper Band Edge

The level 106.5 dBuV/m is the worst case average field strength measurement, from which the delta measurement of 54.1 dB is subtracted (reference plots), which is equivalent to a level of 52.4 dB. This level has a margin of 1.6 dB below the limit of 54 dBuV/m.

Calculation: 106.5 dBuV/m – 54.1dB – 54 dBuV/m = -1.6 dB

QL220 WITH CQ17383-1 ANTENNA
Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 106.7 dBuV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 102.2 dBuV/m

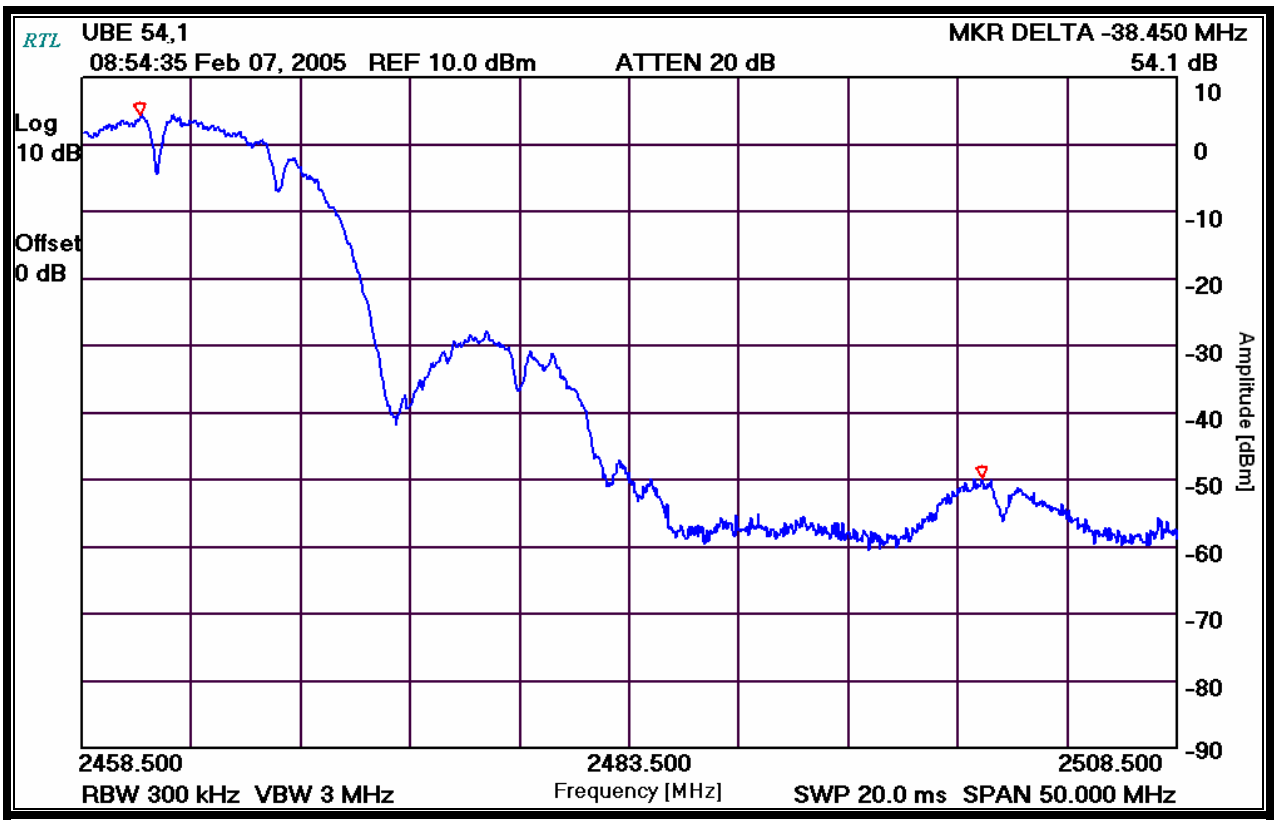
QL420 WITH CQ17383-1 ANTENNA
Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 111.2 dBuV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 106.5 dBuV/m

RW420 WITH CQ17252-1 ANTENNA
Peak field strength of Channel 1 (1 MHz RBW/1 MHz VBW) = 106.7 dBuV/m
Average field strength of Channel 1 (1 MHz RBW/10 Hz VBW) = 102.0 dBuV/m

Delta measurement: 54.1 dB

Channel Number:	11
Frequency (MHz):	2462
Resolution Bandwidth (kHz):	300
Video Bandwidth (MHz):	3
Sweep Time (ms):	20

PLOT 4-2: UPPER BAND EDGE: DELTA MEASUREMENT



TEST PERSONNEL:

Daniel W. Baltzell		February 7, 2005
Test Engineer	Signature	Date Of Test

4.3 BAND EDGE TEST EQUIPMENT

TABLE 4-1: BAND EDGE TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Labs	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901242	Rhein Tech Labs	WRT-000-0003	Wood rotating table	N/A	Not Required
901231	IW Microwave Products	KPS-1503-2400-KPS	High frequency RF cables	240"	9/5/05
901235	IW Microwave Products	KPS-1503-360-KPS	High frequency RF cables	36"	9/5/05
900772	EMCO	3161-02	Horn Antenna	9804-1044	5/20/07
900932	Hewlett Packard	8449B OPT H02	Preamplifier (1 - 26.5 GHz)	3008A00505	5/5/05
901215	Hewlett Packard	8596EM	Spectrum Analyzer (9 kHz - 12.8 GHz)	3826A00144	9/8/05

5 CONDUCTED EMISSIONS – FCC §15.207; IC RSS-210 §6.6 AND 7.4

5.1 TEST METHODOLOGY FOR CONDUCTED EMISSIONS MEASUREMENTS

The power line conducted emission measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50 ohm / 50 microhenry Line Impedance Stabilization Network (EUT LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50 ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 150 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The analyzer's 6 dB bandwidth was set to 9 kHz. No video filter less than 10 times the resolution bandwidth was used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by increasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in this report.

Note: Rhein Tech Laboratories, Inc. has implemented procedures to minimize errors that occur from test instruments, calibration, procedures, and test setups. Test instrument and calibration errors are documented from the manufacturer or calibration lab. Other errors have been defined and calculated within the Rhein Tech Quality Manual, Section 6.1. Rhein Tech implements the following procedures to minimize errors that may occur: yearly as well as daily calibration methods, technician training, and emphasis to employees on avoiding error.

5.2 CONDUCTED EMISSIONS TEST

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. If the conducted emissions exceed the limit, then the instrument is set to the quasi-peak mode and compared to the quasi-peak limit, then measurements are made in the average mode and compared to the average limit. The conducted test was performed with the EUT exercise program loaded, and the emissions were scanned between 150 kHz to 30 MHz on the NEUTRAL SIDE and PHASE SIDE.

5.3 CONDUCTED EMISSIONS TEST DATA

TABLE 5-1: CONDUCTED EMISSIONS (NEUTRAL SIDE) TX CH 1; QL420 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.175	Pk	49.0	0.4	49.4	64.7	-15.3	54.7	-5.3
0.299	Pk	41.5	0.4	41.9	60.3	-18.4	50.3	-8.4
0.421	Pk	45.8	0.5	46.3	57.4	-11.1	47.4	-1.1
1.210	Pk	40.4	0.6	41.0	56.0	-15.0	46.0	-5.0
5.430	Pk	39.1	1.2	40.3	60.0	-19.7	50.0	-9.7
19.440	Pk	28.9	1.4	30.3	60.0	-29.7	50.0	-19.7

TABLE 5-2: CONDUCTED EMISSIONS (PHASE SIDE) TX CH 1; QL420 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.180	Av	36.6	0.4	37.0	64.5	-27.5	54.5	-17.5
0.180	Qp	51.0	0.4	51.4	64.5	-13.1	54.5	-3.1
0.298	Pk	47.3	0.4	47.7	60.3	-12.6	50.3	-2.6
0.419	Pk	45.6	0.5	46.1	57.5	-11.4	47.5	-1.4
0.910	Pk	43.6	0.6	44.2	56.0	-11.8	46.0	-1.8
5.524	Pk	44.0	1.2	45.2	60.0	-14.8	50.0	-4.8
25.440	Pk	35.9	1.6	37.5	60.0	-22.5	50.0	-12.5

TABLE 5-3: CONDUCTED EMISSIONS (NEUTRAL SIDE) TX CH 6; QL420 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.180	Pk	48.7	0.4	49.1	64.5	-15.4	54.5	-5.4
0.269	Pk	42.6	0.4	43.0	61.1	-18.1	51.1	-8.1
0.422	Pk	38.7	0.5	39.2	57.4	-18.2	47.4	-8.2
0.620	Pk	39.4	0.6	40.0	56.0	-16.0	46.0	-6.0
8.050	Pk	37.0	1.2	38.2	60.0	-21.8	50.0	-11.8
19.700	Pk	23.7	1.4	25.1	60.0	-34.9	50.0	-24.9

TABLE 5-4: CONDUCTED EMISSIONS (PHASE SIDE) TX CH 6; QL420 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.180	Av	35.7	0.4	36.1	64.5	-28.4	54.5	-18.4
0.180	Qp	50.5	0.4	50.9	64.5	-13.6	54.5	-3.6
0.299	Pk	42.6	0.4	43.0	60.3	-17.3	50.3	-7.3
0.420	Pk	44.6	0.5	45.1	57.4	-12.3	47.4	-2.3
1.090	Pk	42.3	0.6	42.9	56.0	-13.1	46.0	-3.1
8.170	Pk	39.2	1.2	40.4	60.0	-19.6	50.0	-9.6
27.820	Pk	35.7	1.8	37.5	60.0	-22.5	50.0	-12.5

TABLE 5-5: CONDUCTED EMISSIONS (NEUTRAL SIDE) TX CH 11; QL420 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Pk	48.2	0.4	48.6	64.4	-15.8	54.4	-5.8
0.302	Pk	41.2	0.4	41.6	60.2	-18.6	50.2	-8.6
0.424	Pk	43.6	0.5	44.1	57.4	-13.3	47.4	-3.3
1.090	Pk	42.8	0.6	43.4	56.0	-12.6	46.0	-2.6
5.750	Pk	37.8	1.2	39.0	60.0	-21.0	50.0	-11.0
27.990	Pk	27.4	1.8	29.2	60.0	-30.8	50.0	-20.8

TABLE 5-6: CONDUCTED EMISSIONS (PHASE SIDE) TX CH 11; QL420 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Av	36.0	0.4	36.4	64.4	-28.0	54.4	-18.0
0.181	Qp	50.4	0.4	50.8	64.4	-13.6	54.4	-3.6
0.301	Pk	43.2	0.4	43.6	60.2	-16.6	50.2	-6.6
0.421	Pk	44.7	0.5	45.2	57.4	-12.2	47.4	-2.2
0.910	Pk	42.3	0.6	42.9	56.0	-13.1	46.0	-3.1
8.700	Pk	39.9	1.3	41.2	60.0	-18.8	50.0	-8.8
27.460	Pk	36.3	1.8	38.1	60.0	-21.9	50.0	-11.9

TABLE 5-7: CONDUCTED EMISSIONS (NEUTRAL SIDE) RX; QL-420 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Pk	47.2	0.4	47.6	64.4	-16.8	54.4	-6.8
0.299	Pk	42.6	0.4	43.0	60.3	-17.3	50.3	-7.3
0.419	Pk	45.9	0.5	46.4	57.5	-11.1	47.5	-1.1
2.360	Pk	40.5	0.8	41.3	56.0	-14.7	46.0	-4.7
6.400	Pk	39.0	1.2	40.2	60.0	-19.8	50.0	-9.8
27.350	Pk	29.9	1.7	31.6	60.0	-28.4	50.0	-18.4

TABLE 5-8: CONDUCTED EMISSIONS (PHASE SIDE) RX; QL-420 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.178	Qp	52.8	0.4	53.2	64.6	-11.4	54.6	-1.4
0.178	Av	36.3	0.4	36.7	64.5	-27.8	54.5	-17.8
0.241	Pk	49.7	0.4	50.1	62.1	-12.0	52.1	-2.0
0.358	Pk	40.3	0.4	40.7	58.8	-18.1	48.8	-8.1
0.417	Pk	41.9	0.5	42.4	57.5	-15.1	47.5	-5.1
4.340	Pk	42.6	1.1	43.7	56.0	-12.3	46.0	-2.3
8.410	Pk	40.5	1.3	41.8	60.0	-18.2	50.0	-8.2
25.400	Pk	36.2	1.6	37.8	60.0	-22.2	50.0	-12.2

TABLE 5-9: CONDUCTED EMISSIONS (NEUTRAL SIDE) TX CH 1; RW-420 WITH CQ17252-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.186	Pk	46.5	0.4	46.9	64.2	-17.3	54.2	-7.3
0.302	Pk	40.5	0.4	40.9	60.2	-19.3	50.2	-9.3
0.422	Pk	45.7	0.5	46.2	57.4	-11.2	47.4	-1.2
1.410	Pk	39.3	0.7	40.0	56.0	-16.0	46.0	-6.0
8.970	Pk	33.4	1.4	34.8	60.0	-25.2	50.0	-15.2
25.460	Pk	27.8	1.6	29.4	60.0	-30.6	50.0	-20.6

TABLE 5-10: CONDUCTED EMISSIONS (PHASE SIDE) TX CH 1; RW-420 WITH CQ17252-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Av	36.0	0.4	36.4	64.4	-28.0	54.4	-18.0
0.181	Qp	49.1	0.4	49.5	64.4	-14.9	54.4	-4.9
0.301	Pk	43.9	0.4	44.3	60.2	-15.9	50.2	-5.9
0.424	Pk	45.9	0.5	46.4	57.4	-11.0	47.4	-1.0
1.090	Pk	43.2	0.6	43.8	56.0	-12.2	46.0	-2.2
8.580	Pk	35.6	1.3	36.9	60.0	-23.1	50.0	-13.1
25.990	Pk	31.0	1.7	32.7	60.0	-27.3	50.0	-17.3

TABLE 5-11: CONDUCTED EMISSIONS (NEUTRAL SIDE) TX CH 6; RW-420 WITH CQ17252-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.180	Pk	48.0	0.4	48.4	64.5	-16.1	54.5	-6.1
0.303	Pk	41.7	0.4	42.1	60.2	-18.1	50.2	-8.1
0.422	Pk	45.9	0.5	46.4	57.4	-11.0	47.4	-1.0
0.800	Pk	39.9	0.6	40.5	56.0	-15.5	46.0	-5.5
8.580	Pk	33.4	1.3	34.7	60.0	-25.3	50.0	-15.3
28.760	Pk	27.3	1.9	29.2	60.0	-30.8	50.0	-20.8

TABLE 5-12: CONDUCTED EMISSIONS (PHASE SIDE) TX CH 6; RW-420 WITH CQ17252-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Av	35.9	0.4	36.3	64.4	-28.1	54.4	-18.1
0.181	Qp	45.4	0.4	45.8	64.4	-18.6	54.4	-8.6
0.301	Pk	45.5	0.4	45.9	60.2	-14.3	50.2	-4.3
0.422	Pk	45.3	0.5	45.8	57.4	-11.6	47.4	-1.6
1.210	Pk	41.4	0.6	42.0	56.0	-14.0	46.0	-4.0
8.880	Pk	38.2	1.4	39.6	60.0	-20.4	50.0	-10.4
25.690	Pk	34.2	1.7	35.9	60.0	-24.1	50.0	-14.1

TABLE 5-13: CONDUCTED EMISSIONS (NEUTRAL SIDE) TX CH 11; RW-420 WITH CQ17252-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.176	Pk	45.6	0.4	46.0	64.7	-18.7	54.7	-8.7
0.299	Pk	40.7	0.4	41.1	60.3	-19.2	50.3	-9.2
0.426	Pk	44.6	0.5	45.1	57.3	-12.2	47.3	-2.2
1.090	Pk	40.8	0.6	41.4	56.0	-14.6	46.0	-4.6
8.140	Pk	34.8	1.2	36.0	60.0	-24.0	50.0	-14.0
27.080	Pk	26.4	1.7	28.1	60.0	-31.9	50.0	-21.9

TABLE 5-14: CONDUCTED EMISSIONS (PHASE SIDE) TX CH 11; RW-420 WITH CQ17252-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.180	Av	35.9	0.4	36.3	64.5	-28.2	54.5	-18.2
0.180	Qp	45.8	0.4	46.2	64.5	-18.3	54.5	-8.3
0.302	Pk	42.1	0.4	42.5	60.2	-17.7	50.2	-7.7
0.421	Av	33.2	0.5	33.7	57.4	-23.7	47.4	-13.7
0.421	Qp	41.6	0.5	42.1	57.4	-15.3	47.4	-5.3
0.424	Pk	46.5	0.5	47.0	57.4	-10.4	47.4	-0.4
1.390	Pk	43.2	0.7	43.9	56.0	-12.1	46.0	-2.1
8.730	Pk	39.6	1.4	41.0	60.0	-19.0	50.0	-9.0
26.490	Pk	33.5	1.7	35.2	60.0	-24.8	50.0	-14.8

TABLE 5-15: CONDUCTED EMISSIONS (NEUTRAL SIDE) RX; RW-420 WITH CQ17252-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.182	Pk	46.9	0.4	47.3	64.4	-17.1	54.4	-7.1
0.301	Pk	41.8	0.4	42.2	60.2	-18.0	50.2	-8.0
0.426	Pk	45.2	0.5	45.7	57.3	-11.6	47.3	-1.6
1.330	Pk	38.1	0.7	38.8	56.0	-17.2	46.0	-7.2
8.520	Pk	36.9	1.3	38.2	60.0	-21.8	50.0	-11.8
24.280	Pk	27.0	1.7	28.7	60.0	-31.3	50.0	-21.3

TABLE 5-16: CONDUCTED EMISSIONS (PHASE SIDE) RX; RW-420 WITH CQ17252-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Av	36.8	0.4	37.2	64.4	-27.2	54.4	-17.2
0.181	Qp	46.1	0.4	46.5	64.4	-17.9	54.4	-7.9
0.300	Pk	43.5	0.4	43.9	60.2	-16.3	50.2	-6.3
0.423	Pk	44.3	0.5	44.8	57.4	-12.6	47.4	-2.6
4.450	Pk	43.1	1.1	44.2	56.0	-11.8	46.0	-1.8
8.440	Pk	37.8	1.3	39.1	60.0	-20.9	50.0	-10.9
26.280	Pk	35.1	1.7	36.8	60.0	-23.2	50.0	-13.2

TABLE 5-17: CONDUCTED EMISSIONS (NEUTRAL SIDE) TX CH 1; QL220 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Pk	48.0	0.4	48.4	64.4	-16.0	54.4	-6.0
0.303	Pk	42.6	0.4	43.0	60.2	-17.2	50.2	-7.2
0.423	Pk	44.9	0.5	45.4	57.4	-12.0	47.4	-2.0
1.330	Pk	39.1	0.7	39.8	56.0	-16.2	46.0	-6.2
7.640	Pk	34.5	1.2	35.7	60.0	-24.3	50.0	-14.3
27.020	Pk	28.0	1.7	29.7	60.0	-30.3	50.0	-20.3

TABLE 5-18: CONDUCTED EMISSIONS (PHASE SIDE) TX CH 1; QL220 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Pk	36.2	0.4	36.6	64.4	-27.8	54.4	-17.8
0.181	Qp	49.2	0.4	49.6	64.4	-14.8	54.4	-4.8
0.301	Pk	42.4	0.4	42.8	60.2	-17.4	50.2	-7.4
0.420	Pk	45.6	0.5	46.1	57.4	-11.3	47.4	-1.3
0.910	Pk	42.8	0.6	43.4	56.0	-12.6	46.0	-2.6
8.640	Pk	38.5	1.3	39.8	60.0	-20.2	50.0	-10.2
21.620	Pk	34.1	1.5	35.6	60.0	-24.4	50.0	-14.4

TABLE 5-19: CONDUCTED EMISSIONS (NEUTRAL SIDE) TX CH 6; QL220 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.178	Pk	47.4	0.4	47.8	64.6	-16.8	54.6	-6.8
0.301	Pk	42.2	0.4	42.6	60.2	-17.6	50.2	-7.6
0.425	Pk	44.4	0.5	44.9	57.3	-12.4	47.3	-2.4
1.500	Pk	40.2	0.7	40.9	56.0	-15.1	46.0	-5.1
8.520	Pk	35.3	1.3	36.6	60.0	-23.4	50.0	-13.4
27.880	Pk	27.8	1.8	29.6	60.0	-30.4	50.0	-20.4

TABLE 5-20: CONDUCTED EMISSIONS (PHASE SIDE) TX CH 6; QL220 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Av	35.6	0.4	36.0	64.4	-28.4	54.4	-18.4
0.181	Qp	46.0	0.4	46.4	64.4	-18.0	54.4	-8.0
0.302	Pk	42.8	0.4	43.2	60.2	-17.0	50.2	-7.0
0.425	Pk	44.4	0.5	44.9	57.3	-12.4	47.3	-2.4
0.680	Pk	43.6	0.6	44.2	56.0	-11.8	46.0	-1.8
8.460	Pk	37.5	1.3	38.8	60.0	-21.2	50.0	-11.2
24.130	Pk	31.8	1.8	33.6	60.0	-26.4	50.0	-16.4

TABLE 5-21: CONDUCTED EMISSIONS (NEUTRAL SIDE) TX CH 11; QL-220 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.179	Pk	47.6	0.4	48.0	64.5	-16.5	54.5	-6.5
0.303	Pk	41.7	0.4	42.1	60.2	-18.1	50.2	-8.1
0.425	Pk	45.8	0.5	46.3	57.3	-11.0	47.3	-1.0
1.270	Pk	40.4	0.6	41.0	56.0	-15.0	46.0	-5.0
8.550	Pk	34.2	1.3	35.5	60.0	-24.5	50.0	-14.5
26.670	Pk	28.6	1.7	30.3	60.0	-29.7	50.0	-19.7

TABLE 5-22: CONDUCTED EMISSIONS (PHASE SIDE) TX CH 11; QL-220 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Av	35.5	0.4	35.9	64.4	-28.5	54.4	-18.5
0.181	Qp	50.3	0.4	50.7	64.4	-13.7	54.4	-3.7
0.303	Pk	44.3	0.4	44.7	60.2	-15.5	50.2	-5.5
0.422	Pk	46.1	0.5	46.6	57.4	-10.8	47.4	-0.8
0.422	Av	34.0	0.5	34.5	57.4	-22.9	47.4	-12.9
0.422	Qp	43.9	0.5	44.4	57.4	-13.0	47.4	-3.0
0.970	Pk	42.4	0.7	43.1	56.0	-12.9	46.0	-2.9
8.910	Pk	39.2	1.4	40.6	60.0	-19.4	50.0	-9.4
25.810	Pk	34.5	1.7	36.2	60.0	-23.8	50.0	-13.8

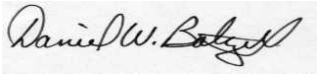
TABLE 5-23: CONDUCTED EMISSIONS (NEUTRAL SIDE) RX; QL-220 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.181	Pk	47.9	0.4	48.3	64.4	-16.1	54.4	-6.1
0.304	Pk	41.3	0.4	41.7	60.1	-18.4	50.1	-8.4
0.429	Pk	43.1	0.5	43.6	57.3	-13.7	47.3	-3.7
2.120	Pk	39.8	0.8	40.6	56.0	-15.4	46.0	-5.4
7.790	Pk	32.7	1.2	33.9	60.0	-26.1	50.0	-16.1
24.690	Pk	27.1	1.7	28.8	60.0	-31.2	50.0	-21.2

TABLE 5-24: CONDUCTED EMISSIONS (PHASE SIDE) RX; QL-220 WITH CQ17383-1 ANTENNA

Temperature: 74°F Humidity: 55%								
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)
0.182	Pk	35.5	0.4	35.9	64.4	-28.5	54.4	-18.5
0.182	Qp	49.0	0.4	49.4	64.4	-15.0	54.4	-5.0
0.301	Pk	45.6	0.4	46.0	60.2	-14.2	50.2	-4.2
0.422	Pk	46.1	0.5	46.6	57.4	-10.8	47.4	-0.8
2.120	Pk	42.9	0.8	43.7	56.0	-12.3	46.0	-2.3
8.580	Pk	36.5	1.3	37.8	60.0	-22.2	50.0	-12.2
26.250	Pk	32.6	1.7	34.3	60.0	-25.7	50.0	-15.7

TEST PERSONNEL:



Daniel W. Baltzell		February 15, 2005
Test Engineer	Signature	Date Of Test

5.4 CONDUCTED EMISSIONS TEST EQUIPMENT

TABLE 5-25: CONDUCTED EMISSIONS TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900339	Hewlett Packard	85650A	Quasi-Peak Adapter (30 Hz-1 GHz)	2521A00743	4/28/05
901084	AFJ international	LS16	16A LISN	16010020082	12/24/05
900968	Hewlett Packard	8567A	Spectrum Analyzer (10 kHz-1.5 GHz)	2602A00160	4/28/05
900970	Hewlett Packard	85662A	Spectrum Analyzer Display	2542A11239	4/28/05

6 RADIATED EMISSIONS FOR RECEIVER/DIGITAL INTERFACE – FCC §15.209; IC RSS-210 §7.3

6.1 RADIATED EMISSIONS TEST PROCEDURE FOR RECEIVER/DIGITAL INTERFACE

Radiated spurious emissions for receiver/digital interface fall in the restricted and non-restricted bands between 30 MHz and up to the 2nd LO when the EUT is in the receiver/digital interface mode. The IF, LO and up to the 2nd LO of the receiver were investigated and tested. Channels 1, 6, and 11 were tested and investigated and the highest levels measured are presented. The restricted bands are listed in FCC Part 15.205 and the maximum permitted average field strength for the restricted band is listed in Part 15.209. The data in this report represents the worst case modes.

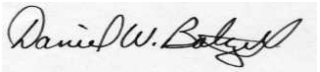
6.2 RADIATED EMISSION TEST DATA RECEIVER/DIGITAL INTERFACE

TABLE 6-1: DIGITAL RADIATED EMISSIONS TEST DATA

Temperature: 44°F Humidity: 52%									
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
220.000	Qp	H	0	1.5	43.4	-19.6	23.8	46.0	-22.2
264.000	Qp	V	80	1.5	49.0	-16.7	32.3	46.0	-13.7
275.000	Qp	V	0	1.0	39.2	-16.6	22.6	46.0	-23.4
286.000	Qp	V	0	1.5	41.5	-16.5	25.0	46.0	-21.0
308.000	Qp	V	0	1.0	46.8	-15.6	31.2	46.0	-14.8
319.000	Qp	V	30	1.0	44.4	-15.1	29.3	46.0	-16.7
330.000	Qp	V	0	1.5	44.0	-15.1	28.9	46.0	-17.1
352.000	Qp	V	300	1.0	52.7	-14.2	38.5	46.0	-7.5
363.000	Qp	V	30	1.0	43.4	-13.5	29.9	46.0	-16.1
374.000	Qp	V	30	1.0	47.3	-13.3	34.0	46.0	-12.0
396.000	Qp	V	30	1.1	50.8	-12.4	38.4	46.0	-7.6
440.000	Qp	V	180	1.0	47.4	-11.1	36.3	46.0	-9.7
484.012	Qp	V	180	1.0	43.4	-10.3	33.1	46.0	-12.9
528.012	Qp	V	300	1.0	41.5	-9.3	32.2	46.0	-13.8
572.000	Qp	V	0	1.0	41.7	-8.3	33.4	46.0	-12.6

QP: RES. = 100 KHZ, VID = 100 KHZ

TEST PERSONNEL:



Daniel W. Baltzell		April 13, 2005
Test Engineer	Signature	Date Of Test

6.3 RADIATED DIGITAL EMISSIONS TEST EQUIPMENT

TABLE 6-2: RADIATED DIGITAL EMISSIONS TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Labs	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901242	Rhein Tech Labs	WRT-000-0003	Wood rotating table	N/A	Not Required
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz - 2 GHz)	2648	9/20/05
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	6/23/05
900811	Rhein Tech Labs	PR-1040	Amplifier	1003	3/8/06

7 RADIATED EMISSION RADIATED HARMONICS/SPURIOUS NOISE – FCC §15.247; IC RSS-210 §6.2.2(O)(E1); §6.3

7.1 RADIATED EMISSION TEST PROCEDURE FOR HARMONICS/SPURIOUS NOISE

Radiated Spurious Emissions applies to harmonics and spurious emissions that fall in the restricted bands when the EUT is configured in the transmit mode. The restricted bands are listed in Part 15.205. The maximum permitted average field strength for the restricted band is listed in Part 15.209. The EUT was tested in three orthogonal planes from 10 kHz to the 10th harmonic of the fundamental. The data in this report represents the worst case modes.

7.2 RADIATED EMISSIONS HARMONICS/SPURIOUS TEST DATA

TABLE 7-1: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 1/2412 MHZ) CQ17383-1 ANTENNA USING QL-220 HOST

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2374.438	43.9	32.5	10.6	43.1	54.0	-10.9
2448.890	42.1	33.2	10.8	44.0	75.2	-31.2
4824.000	40.0	35.3	14.3	49.6	54.0	-4.4
7236.000	34.0	21.4	13.1	34.5	75.2	-40.7
9648.041	37.9	31.5	18.6	50.1	75.2	-25.1
12060.041	35.7	22.6	19.9	42.5	54.0	-11.5

Fundamental Field Strength (100 kHz / dBuV/m): 95.2

TABLE 7-2: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 6/2437 MHZ) CQ17383-1 ANTENNA USING QL-220 HOST

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2400.180	44.6	34.6	10.6	45.2	74.3	-29.1
2474.690	42.9	33.3	10.9	44.2	74.3	-30.1
4874.000	39.3	35.4	14.4	49.8	54.0	-4.2
7311.000	33.1	21.5	13.1	34.6	54.0	-19.4
9748.000	37.5	29.1	18.2	47.3	74.3	-27.0
12185.000	35.0	22.6	18.5	41.1	54.0	-12.9

Fundamental Field Strength (100 kHz / dBuV/m): 94.3

TABLE 7-3: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 11/2462 MHZ) CQ17383-1 ANTENNA USING QL-220 HOST

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2424.210	43.1	34.2	11.0	45.2	74.5	-29.3
2499.450	44.0	34.3	11.1	45.4	54.0	-8.6
4924.000	36.1	31.1	14.7	45.8	54.0	-8.2
7386.000	31.1	21.7	13.3	35.0	54.0	-19.0
9848.000	37.4	29.5	18.2	47.7	74.5	-26.8
12310.000	34.6	22.2	18.7	40.9	54.0	-13.1

Fundamental Field Strength (100 kHz / dBuV/m): 94.5

TABLE 7-4: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 1/2412 MHZ) CQ17252-1 ANTENNA USING RW-420 HOST

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2374.650	41.9	30.2	10.6	40.8	54.0	-13.2
2448.700	39.4	27.2	10.8	38.0	73.2	-35.2
4824.000	40.1	36.8	14.3	51.1	54.0	-2.9
7236.000	33.4	20.3	13.1	33.4	73.2	-39.8
9648.000	35.6	27.0	18.6	45.6	73.2	-27.6
12060.000	34.0	22.4	19.9	42.3	54.0	-11.7

Fundamental Field Strength (100 kHz / dBuV/m): 93.2

TABLE 7-5: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 6/2437 MHZ) CQ17252-1 ANTENNA USING RW-420 HOST

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2399.600	40.3	28.9	10.6	39.5	72.5	-33.0
2474.738	39.5	29.5	10.9	40.4	72.5	-32.1
4874.000	39.5	35.1	14.4	49.5	54.0	-4.5
7311.000	33.6	15.0	13.1	28.1	54.0	-25.9
9748.000	36.6	27.9	18.2	46.1	72.5	-26.4
12185.000	35.4	22.0	18.5	40.5	54.0	-13.5

Fundamental Field Strength (100 kHz / dBuV/m): 92.5

TABLE 7-6: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 11/2462 MHZ) CQ17252-1 ANTENNA USING RW-420 HOST

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2424.580	37.9	27.3	11.0	38.3	74.3	-36.0
2499.726	39.8	28.8	11.1	39.9	54.0	-14.1
4924.000	39.4	35.9	14.7	50.6	54.0	-3.4
7386.000	34.3	21.3	13.3	34.6	54.0	-19.4
9848.000	37.4	27.9	18.2	46.1	74.3	-28.2
12310.000	34.5	21.6	18.7	40.3	54.0	-13.7

Fundamental Field Strength (100 kHz / dBuV/m): 94.3

TABLE 7-7: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 1/2412 MHZ) CQ17383-1 ANTENNA USING QL-420 HOST

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2374.409	45.3	34.5	54.0	-8.9	54.0	-8.9
2448.700	40.4	30.8	78.4	-36.8	78.4	-36.8
4824.000	38.0	32.5	54.0	-7.2	54.0	-7.2
7236.000	34.2	21.6	78.4	-43.7	78.4	-43.7
9648.000	38.1	30.9	78.4	-28.9	78.4	-28.9
12060.000	35.6	22.8	54.0	-11.3	54.0	-11.3

Fundamental Field Strength (100 kHz / dBuV/m): 98.4

TABLE 7-8: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 6/2437 MHZ) CQ17383-1 ANTENNA USING QL-420 HOST

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2399.450	42.7	31.9	10.6	42.5	77.5	-35.0
2474.740	42.8	31.6	10.9	42.5	77.5	-35.0
4874.000	37.0	31.2	14.4	45.6	54.0	-8.4
7311.000	33.1	20.8	13.1	33.9	54.0	-20.1
9748.000	35.0	25.7	18.2	43.9	77.5	-33.6
12185.000	35.3	22.0	18.5	40.5	54.0	-13.5

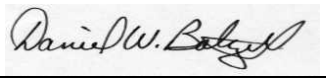
Fundamental Field Strength (100 kHz / dBuV/m): 97.5

TABLE 7-9: RADIATED EMISSIONS HARMONICS/SPURIOUS (CHANNEL 11/2462 MHZ) CQ17383-1 ANTENNA USING QL-420 HOST

Emission Frequency (MHz)	Peak Test Detector (dBuV)	Average Test Detector (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2424.580	41.9	31.7	11.0	42.7	78.6	-35.9
2498.750	41.7	32.1	11.1	43.2	54.0	-10.8
4924.000	37.5	33.3	14.7	48.0	54.0	-6.0
7386.000	34.0	21.2	13.3	34.5	54.0	-19.5
9848.000	35.6	27.6	18.2	45.8	78.6	-32.8
12310.000	34.9	21.6	18.7	40.3	54.0	-13.7

Fundamental Field Strength (100 kHz / dBuV/m): 98.6

TEST PERSONNEL:



Daniel W. Baltzell		February 6, 2005
Test Engineer	Signature	Date Of Test

7.3 RADIATED SPURIOUS EMISSIONS TEST EQUIPMENT

TABLE 7-10: RADIATED SPURIOUS EMISSIONS TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Labs	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901242	Rhein Tech Labs	WRT-000-0003	Wood rotating table	N/A	Not Required
901231	IW Microwave Products	KPS-1503-2400-KPS	High frequency RF cables	240"	9/5/05
901235	IW Microwave Products	KPS-1503-360-KPS	High frequency RF cables	36"	9/5/05
900772	EMCO	3161-02	Horn Antenna (2–4 GHz)	9804-1044	5/20/07
900321	EMCO	3161-03	Horn Antennas (4-8,2 GHz)	9508-1020	5/20/07
900323	EMCO	3160-7	Horn Antennas (8,2-12,4 GHz)	9605-1054	5/20/07
900325	EMCO	3160-9	Horn Antennas (18-26.5 GHz)	9605-1051	5/20/07
900932	Hewlett Packard	8449B OPT H02	Preamplifier (1-26.5 GHz)	3008A00505	5/5/05
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz-40 GHz)	3943A01719	8/11/05

8 MODULATED BANDWIDTH – FCC §15.247(A)(2)

8.1 MODULATED BANDWIDTH TEST PROCEDURE

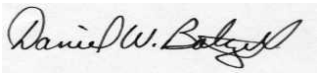
The minimum 6 dB bandwidth per FCC 15.247 (a)(2) was measured using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 1 MHz. The minimum 6 dB modulated bandwidths are the following:

8.2 MODULATED BANDWIDTH TEST DATA

TABLE 8-1: MINIMUM 6 DB MODULATED BANDWIDTHS

CHANNEL	6 dB BANDWIDTH (MHz)
1	10.18
6	10.10
11	10.14

TEST PERSONNEL:

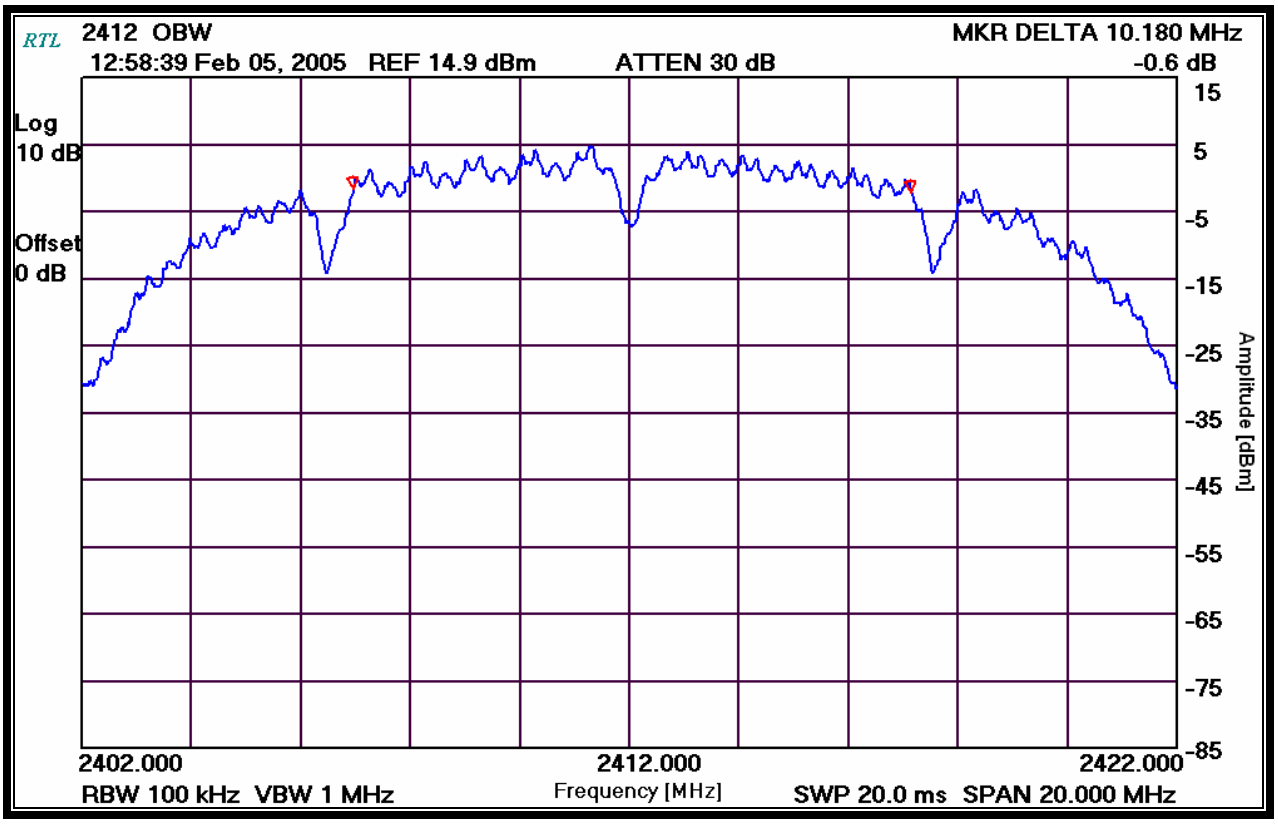


Daniel Baltzell		February 5, 2005
Test Engineer	Signature	Date Of Test

8.3 MODULATED BANDWIDTH PLOTS

Channel Number:	1
Frequency (MHz):	2412
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1
Sweep Time (ms):	20.0

PLOT 8-1: MODULATED BANDWIDTH CHANNEL 1

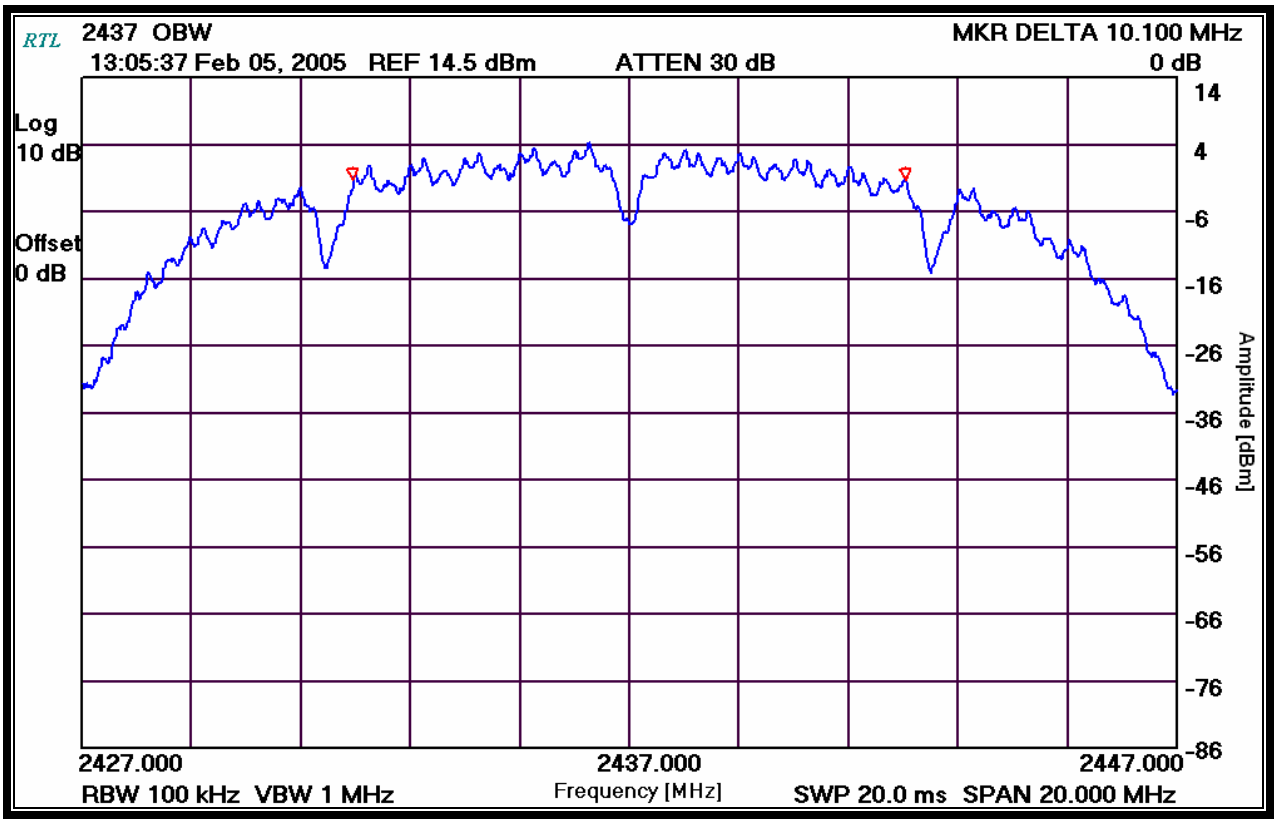


TEST PERSONNEL:

Daniel Baltzell	Daniel W. Baltzell	February 5, 2005
Test Engineer	Signature	Date Of Test

Channel Number:	6
Frequency (MHz):	2437
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1
Sweep Time (ms):	20.0

PLOT 8-2: MODULATED BANDWIDTH CHANNEL 6

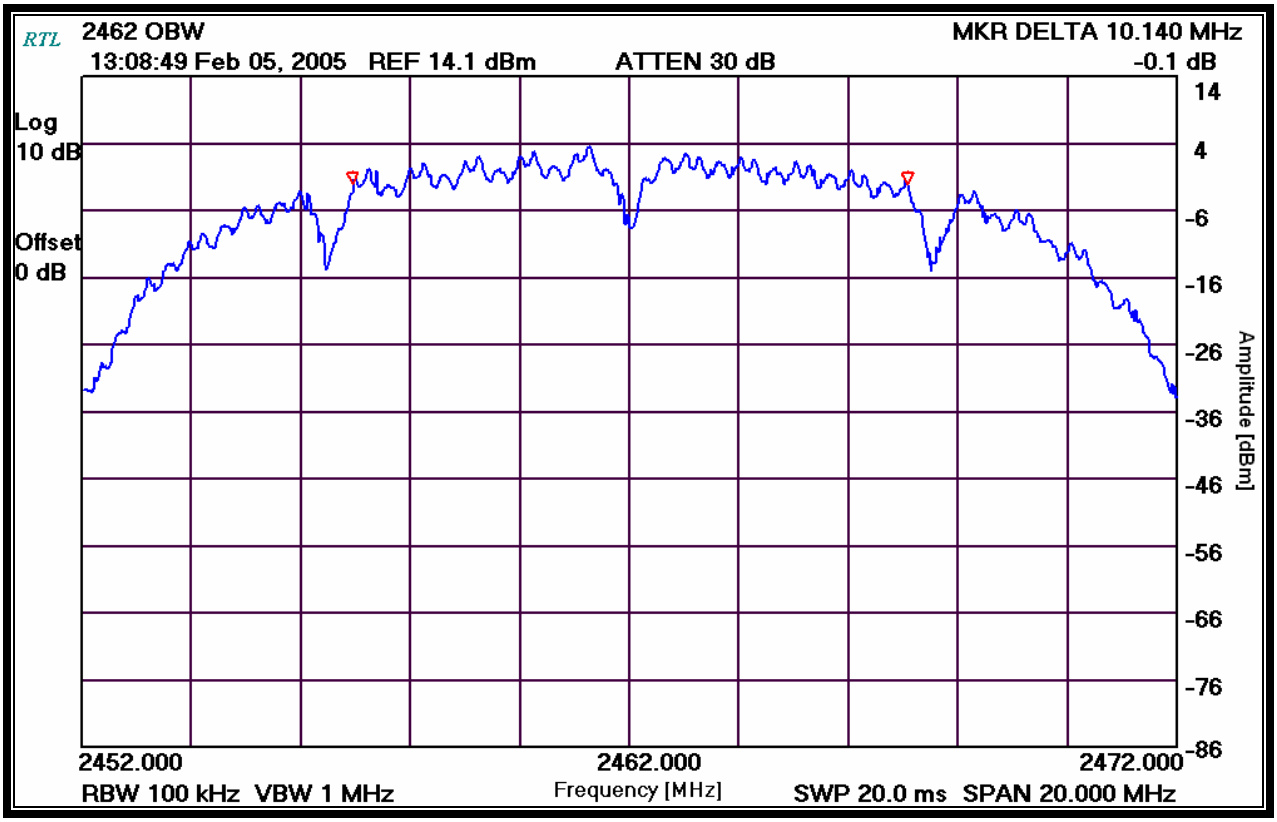


TEST PERSONNEL:

Daniel Baltzell	Daniel W. Baltzell	February 5, 2005
Test Engineer	Signature	Date of Test

Channel Number:	11
Frequency (MHz):	2462
Resolution Bandwidth (kHz):	100
Video Bandwidth (MHz):	1
Sweep Time (ms):	20.0

PLOT 8-3: MODULATED BANDWIDTH CHANNEL 11



TEST PERSONNEL:

Daniel Baltzell		February 5, 2005
Test Engineer	Signature	Date Of Test

8.4 MODULATED BANDWIDTH TEST EQUIPMENT

TABLE 8-2: MODULATED BANDWIDTH TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	6/23/05

9 ANTENNA CONDUCTED SPURIOUS EMISSIONS – FCC §15.247(C); IC RSS-210 §6.2.2(O)(E1)

9.1 ANTENNA CONDUCTED SPURIOUS EMISSIONS TEST PROCEDURES

Antenna spurious emission per FCC 15.247(c) was measured from the EUT antenna port using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 300 kHz. The modulated carrier was identified at 2.412 GHz for Channel 1, 2.437 GHz for Channel 6, and 2.462 GHz for Channel 11. No other harmonics or spurs were found within 20 dB of the carrier level, and from 9 kHz to the carriers 10^{th} harmonic. A notch filter was not used; it was found to have no effect in the levels.

Channels 1, 6, and 11 were investigated and tested.

9.2 ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 1

Operating Frequency (MHz): 2412
Channel: 1
Measured Peak Conducted Power (dBm): 4
Conducted Spurious Limit (dBm): -16

TABLE 9-1: ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 1

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limits (dBc)	Margin (dB)
2374.350	-50.7	54.7	20.0	-34.7
2449.520	-50.9	54.9	20.0	-34.9
4823.940	-66.9	70.9	20.0	-50.9
7236.450	-74.2	78.2	20.0	-58.2
9647.850	-69.5	73.5	20.0	-53.5
14471.850	-83.9	87.9	20.0	-67.9

9.3 ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 6

Operating Frequency (MHz): 2437
Channel: 6
Measured Peak Conducted Power (dBm): 4.3
Conducted Spurious Limit (dBm): -15.7

TABLE 9-2: ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 6

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limits (dBc)	Margin (dB)
2400.000	-51.5	55.8	20.0	-35.8
2474.400	-52.4	56.7	20.0	-36.7
4873.980	-63.4	67.7	20.0	-47.7
7308.760	-69.6	73.9	20.0	-53.9
9747.920	-74.5	78.8	20.0	-58.8
12186.640	-80.9	85.2	20.0	-65.2

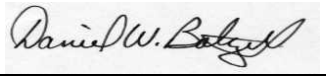
9.4 ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 11

Operating Frequency (MHz): 2462
Channel: 11
Measured Peak Conducted Power (dBm): 3.1
Conducted Spurious Limit (dBm): -15.6

TABLE 9-3: ANTENNA CONDUCTED SPURIOUS EMISSIONS CHANNEL 11

Frequency (MHz)	Measured Level (dBm)	Measured Level (dBc)	Limits (dBc)	Margin (dB)
2424.300	-50.7	55.1	20.0	-35.1
2499.610	-52.8	57.2	20.0	-37.2
4924.000	-63.4	67.8	20.0	-47.8
7385.420	-78.3	82.7	20.0	-62.7
9847.920	-69.4	73.8	20.0	-53.8
12300.060	-80.9	85.3	20.0	-65.3

TEST PERSONNEL:

Daniel W. Baltzell		February 5, 2005
Test Engineer	Signature	Date Of Test

9.5 ANTENNA CONDUCTED SPURIOUS TEST EQUIPMENT

TABLE 9-4: ANTENNA CONDUCTED SPURIOUS TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	6/23/05

10 POWER SPECTRAL DENSITY – FCC §15.247(D); IC RSS-210 §6.2.2(O)(B)

10.1 POWER SPECTRAL DENSITY TEST PROCEDURE

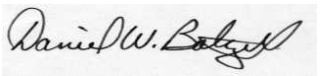
The power spectral density per FCC 15.247(d) was measured using a 50 ohm spectrum analyzer with the resolution bandwidth set at 3 kHz, the video bandwidth set at 30 kHz, and the sweep time set at 500 seconds. The test was performed as a conducted test. The spectral lines were resolved for the modulated carriers at 2.412 GHz, 2.437 GHz, and 2.462 GHz respectively. These levels are well below the +8 dBm limit. See the power spectral density table and plots that follow.

10.2 POWER SPECTRAL DENSITY TEST DATA

TABLE 10-1: POWER SPECTRAL DENSITY

CHANNEL	POWER SPECTRAL DENSITY (dBm) (LIMIT = +8dBm)
1	-8.5
6	-8.7
11	-9.2

TEST PERSONNEL:

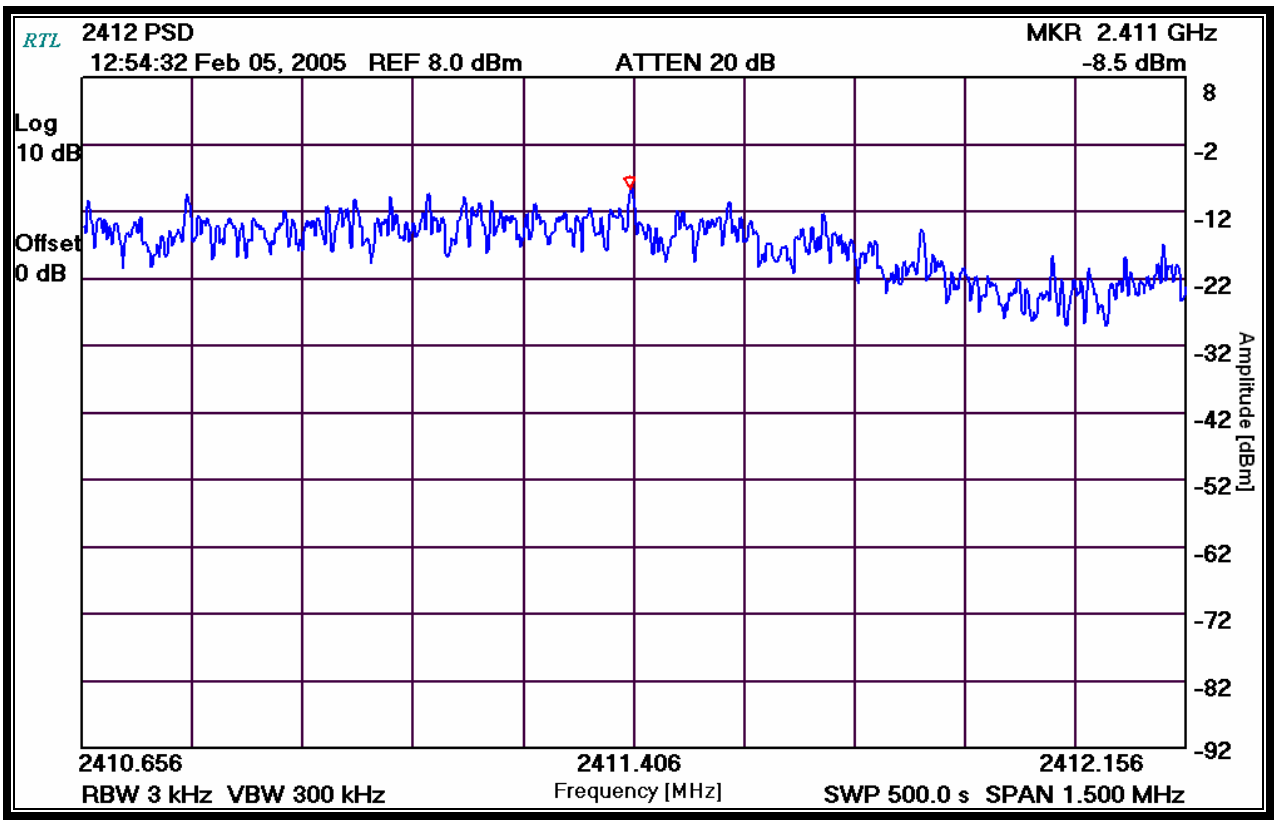


Daniel Baltzell		February 5, 2005
Test Engineer	Signature	Date Of Test

10.3 POWER SPECTRAL DENSITY PLOTS

Operating Frequency (MHz):	2412
Channel:	1
Bandwidth Resolution (kHz):	3
Bandwidth Video (kHz):	300
Sweep Time (s):	500

PLOT 10-1: POWER SPECTRAL DENSITY: CHANNEL 1

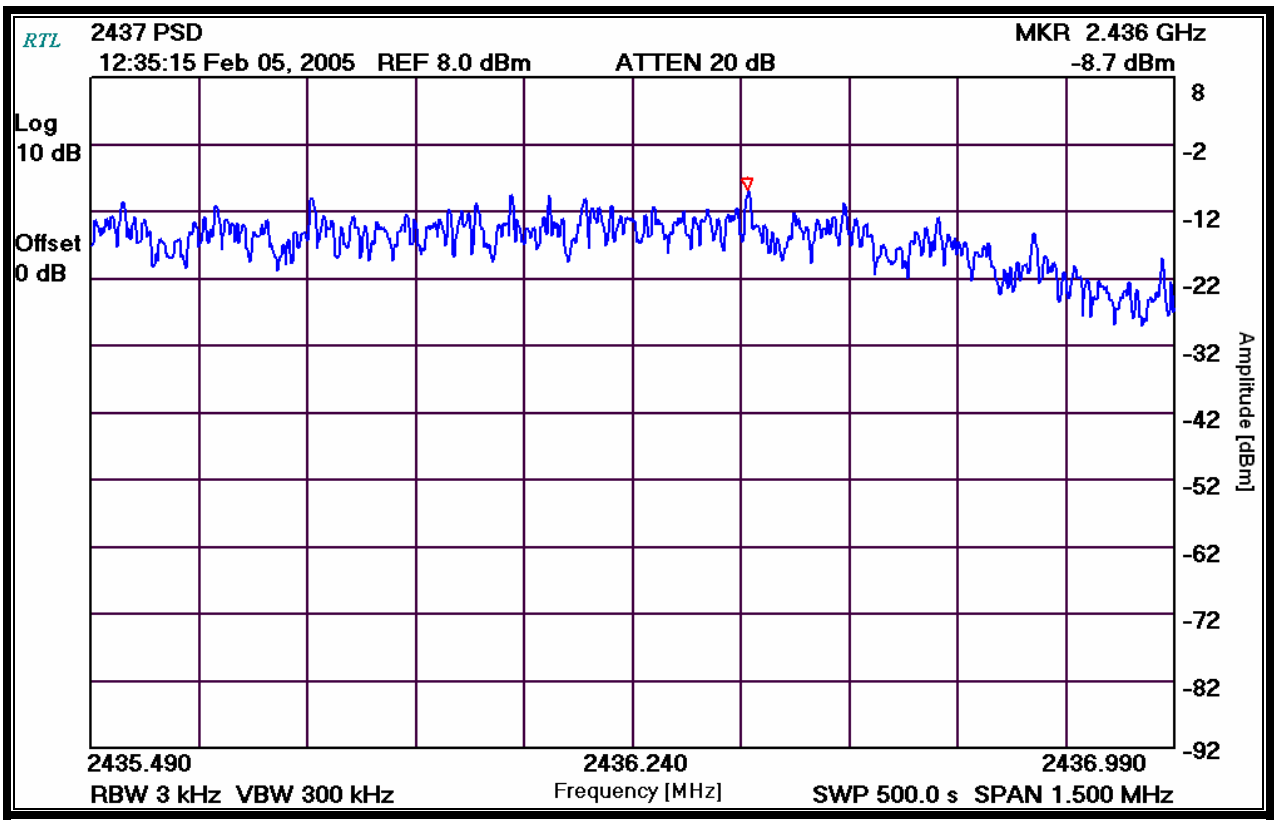


TEST PERSONNEL:

Daniel Baltzell	Daniel W. Baltzell	February 5, 2005
Test Engineer	Signature	Date Of Test

Operating Frequency (MHz):	2437
Channel:	6
Bandwidth Resolution (kHz):	3
Bandwidth Video (kHz):	300
Sweep Time (s):	500

PLOT 10-2: POWER SPECTRAL DENSITY: CHANNEL 6

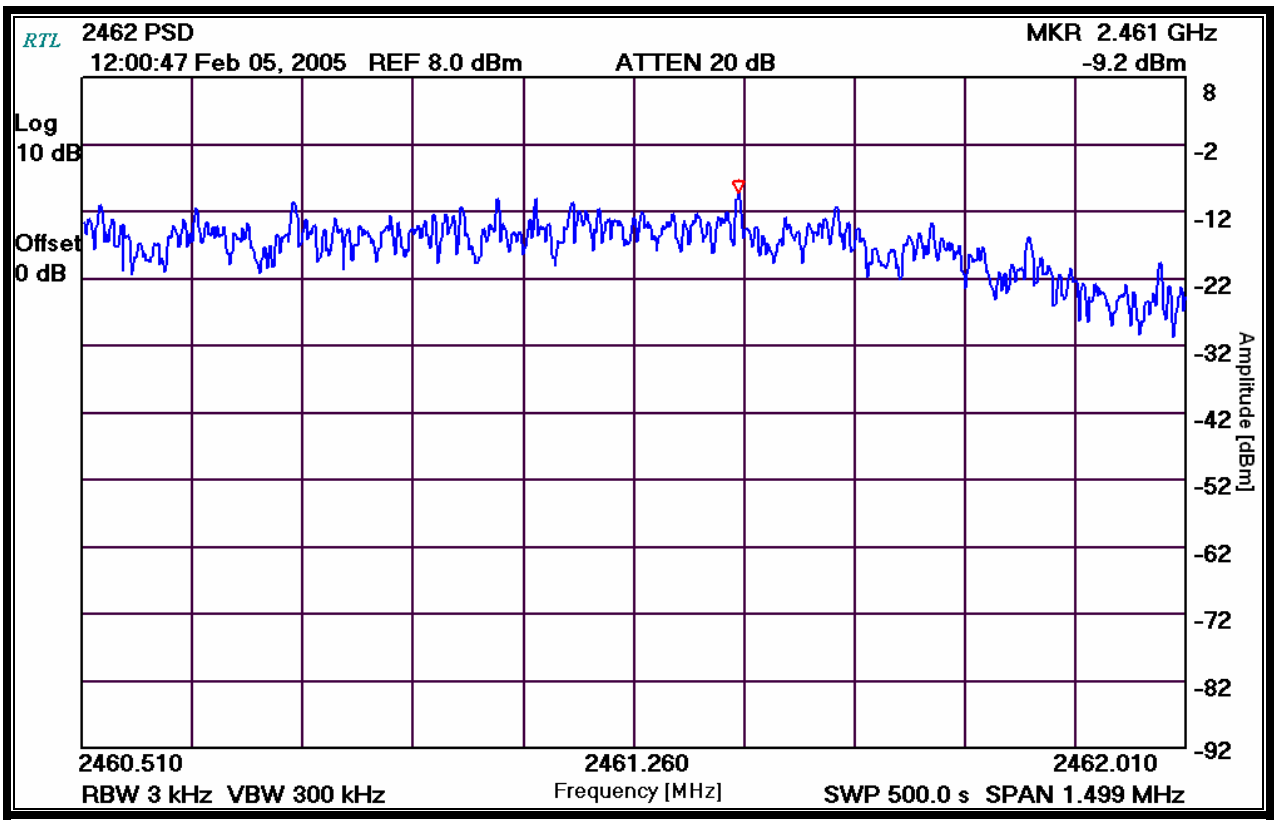


TEST PERSONNEL:

Daniel Baltzell		February 5, 2005
Test Engineer	Signature	Date Of Test

Operating Frequency (MHz):	2462
Channel:	11
Bandwidth Resolution (kHz):	3
Bandwidth Video (kHz):	300
Sweep Time (s):	500

PLOT 10-3: POWER SPECTRAL DENSITY: CHANNEL 11



TEST PERSONNEL:

Daniel Baltzell		February 5, 2005
Test Engineer	Signature	Date Of Test

10.4 POWER SPECTRAL DENSITY TEST EQUIPMENT

TABLE 10-2: POWER SPECTRAL DENSITY TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	6/23/05

11 CONCLUSION

The data in this measurement report shows that the Zebra Technologies Model # AT17192-1, FCC ID: I28MD-ZLAN11B, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules, Industry Canada RSS-210, ANSI 63.4 and FCC 97-114 (DSSS).