COMPLIANCE WORLDWIDE INC
TEST REPORT 154-06

In Accordance with the Requirements of

Industry Canada RSS 210, Issue 6, Annex 2
Federal Communications Commission CFR Title 47 Part 15.225, Subpart C

Low Power License-Exempt Radio communication Devices
Intentional Radiators

issued to

TYCO Software House
70 Westview Street
Lexington, MA 02421 USA
(781) 768 0205

for

RM2L-4000
Proximity Card Reader with Keypad and LCD Display

FCC ID: SZC-4000
IC: 5690A-4000

on

March 31, 2006

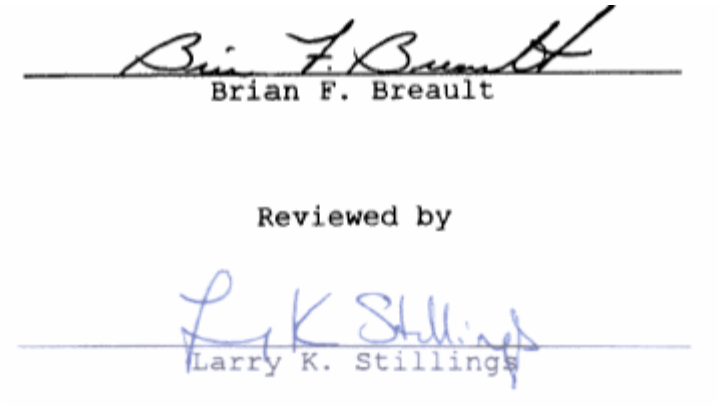


Table of Contents

1. Test Description

1.1 Test Objective

To test the RM2L-4000 to RSS 210 / Part 15 Subpart C Rules and detail the results in a test report.

1.2 E.U.T. Description

GENERAL: The RM2L-4000 is an access control user interface that includes a keypad, LCD display and RF proximity card reader.

Serial Number: Pre-production unit

2. Test Results And Conclusions

2.1 Product Tested: Proximity Card Reader with keypad and LCD

2.2 Model Number: RM2L-4000

2.3 Radiated Emissions Test Results

The test results conclude that the emissions radiated from this equipment are in compliance with ICRules RSS 210 / FCC Rules Part 15 Subpart C.

2.4 Occupied Bandwidth & Output Power

The test results conclude that the occupied bandwidth and output power of this equipment are in compliance with IC Rules RSS 210 / FCC Rules Part 15 Subpart C .

2.5 Conducted Emissions Test Results

The test results conclude that the emissions conducted through the power line from this equipment are in compliance with IC Rules RSS 210 / FCC Rules Part 15 Subpart C.

2.6 Analysis And Conclusions

Based upon the radiated and conducted measurements we find that this equipment is within the limits of the IC Rules RSS 210 / FCC Rules Part 15 Subpart C requirements. All results are based on a test of one sample, and represent other production units, only in as much as a sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

2.7 Notes (Special conditions unique to this test)

None

3. Test Equipment and Test Procedures

3.1 Measurement Equipment

Device	Manufacturer	Model	Serial #	Cal. Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	1/5/2007
Temp. Meter	Fluke	187	4804030	3/14/2007
Thermal Chamber	Associated	SLHU-1-CRLC	0029	N/A
Loop Antenna	EMCO	6502	2197	3/16/2008
Biconilog Antenna	Com-Power	AC220	25509	7/11/2006
LISN	EMCO	EM 3825/2	9109-1860	12/15/2006

All equipment used for testing has been calibrated according to the methods and procedures defined by the National Institute of Standards and Technology (NIST).

3.2 Frequency Range To Be Scanned.

A. Radiated emissions Test from 100 kHz to 40 GHz (or the 10^{th} harmonic of the highest frequency whichever is lower).

B. Conducted emissions Test from 150 kHz to 30 MHz.

3.3 Radiated Emissions Test Procedures.

The EUT, associated cables and peripheral devices are placed on an 80 cm high table. Any support equipment is configured remotely. The EUT is powered on and given a sufficient amount of time to achieve thermal stability. Any necessary operating or test software is installed. The EUT is first pre-scanned in a semi-anechoic chamber where it is rotated 360 degrees and examined in both horizontal and vertical antenna polarities. All emissions within the required frequency bands are identified and recorded. The EUT is then relocated to the open area test site. The required frequency bands are again investigated and all frequencies identified in the chamber are revisited. For each emission, the turntable is rotated 360 degrees to determine the position at which the emission maximizes. At the maximized turntable position, the antenna height is varied from 1 to 4 meters to determine the antenna position at which the maximum level occurs. In this manner, both vertical and horizontal antenna polarities are measured and recorded. When necessary, the EUT cables are repositioned to determine if they have an effect on the level of the emission.

3.4 Conducted Emissions Test Procedure:

The power line of the EUT is connected to a Line Impedance Stabilization Network (LISN). Emissions conducted onto the power line by the EUT are measured in the frequency range from 150 kHz to 30 MHz. Both phase (L1) and neutral (L2) are investigated and the maximum readings are recorded.

All measurements are made according to the procedures defined in: "ANSI C63.4-2003 Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz, American National Standard for (ISBN 1-55937-215-5).

4. RSS 210 Test Limits

4.1 RSS 210 Annex 2, Table 3 Radiation Limits (Quasi-Peak): FCC Part 15.209, 15.235, 15.249 Radiation Limits (Quasi-Peak):

Frequency MHz	Distance Meters	Limit dBµV/m	Limit µV/m
1.705 - 30	30	29.5*	30*
13.553-13.567	30	84.0	15,848/15,500
30 - 88	3	40.0	100
88 - 216	3	43.5	150
216 - 960	3	46.0	200
960 - 1000	3	54.0	500
1000 - 40000	3	54.0*	500*

*NOTE: Average Limits

4.2. RSS 210 Annex 2 Conducted Emissions Limits (Quasi-Peak): FCC Part 15.207 Conducted Emissions Limits (Quasi-Peak)

Frequency MHz	Quasi-Peak Limit dBµV	Average Limit dBµV
0.150 - 0.500	66 to 56	56 to 46
0.500 - 5.0	56	46
5.0 - 30.0	60	50

5. Test Facility Description

Compliance Worldwide is located on 357 Main Street in Sandown, New Hampshire. The conducted and radiated test sites, located at C.W. are used for Federal Communications Commission (FCC) testing and Industry Canada Testing. A site description is on file with the FCC in Columbia, MD USA. Site information is also on file with Industry Canada, anyone wishing to review this Test Facility Description is referred to file number **IC 3023**. This is currently on file at Industry Canada, 1241 Clyde Avenue, Ottawa, ON K2C 1Y3.

The radiated site is a 3/10 meter indoor site with an enclosure for the product and a basement for the personnel, support equipment and test equipment.

The conducted site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical metal wall required by EN 55022.

Both sites are designed to test products or systems 1.5 meter x 1.0 meter, floor standing or table top.

FCC SITE DESCRIPTION DATE: 3-6-2000, Renewal Date: 8-23-2003

IC SITE DESCRIPTION DATE: 8-11-2000, Renewal Date: 9-23-2003

6. Product Identification

Product Tested: Proximity Card Reader with Keypad and LCD Display

Model Number: RM2L- 4000

Serial Number:

Input power: Supplied by the Access Controller (C Cure apC/8X)

Application Software: C-Cure System Generator
C-Cure System Monitor

Additional Notes: A motorized unit with two cards attached was used to force the RM2L-4000 to make continuous reads.

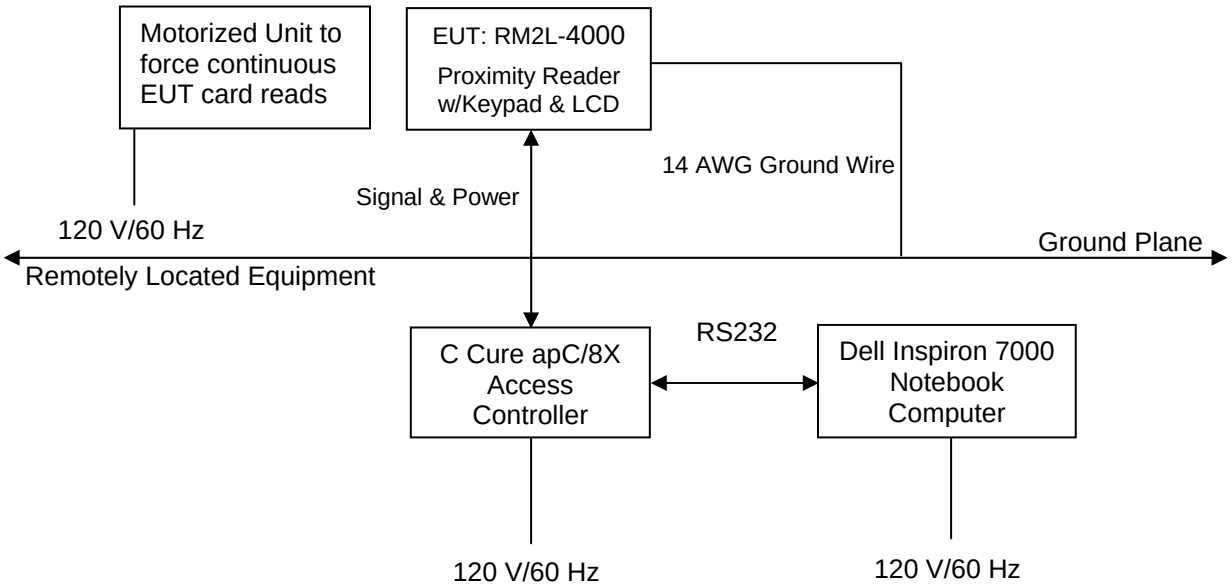
Support Equipment:

Description	Manufacturer	Model	Serial No.
Access Controller	Tyco Software House	C Cure apC/8X	N/A
Notebook Computer	Dell	Inspiron 7000	N/A

Cables:

Cable	From	To	Length	Shielded
14 AWG Ground Wire	EUT	Ground Plane	1 Meter	No
Signal and Power	EUT	C Cure apC/8X	5 Meters	Yes
RS232	C Cure apC/8X	Notebook Computer	1 Meter	Yes

Block Diagram:



7. Test Measurements and Results

7.1 Radiated Emissions Test Results

Frequency Range:	.009 - 1000 MHz.
Measurement Distance:	3.0 Meters.
Bandwidth:	ANSI C63.4-2003.* Requirement for Selected Range
Detector Functions:	Peak
Video Filter:	Auto for Selected Range
Table Height:	0.8 meters
Antenna Height Variation:	1 – 4 Meters.

Horizontal and Vertical Polarization Measurements Investigated.

7.2.1 Worst Case Tabular Data

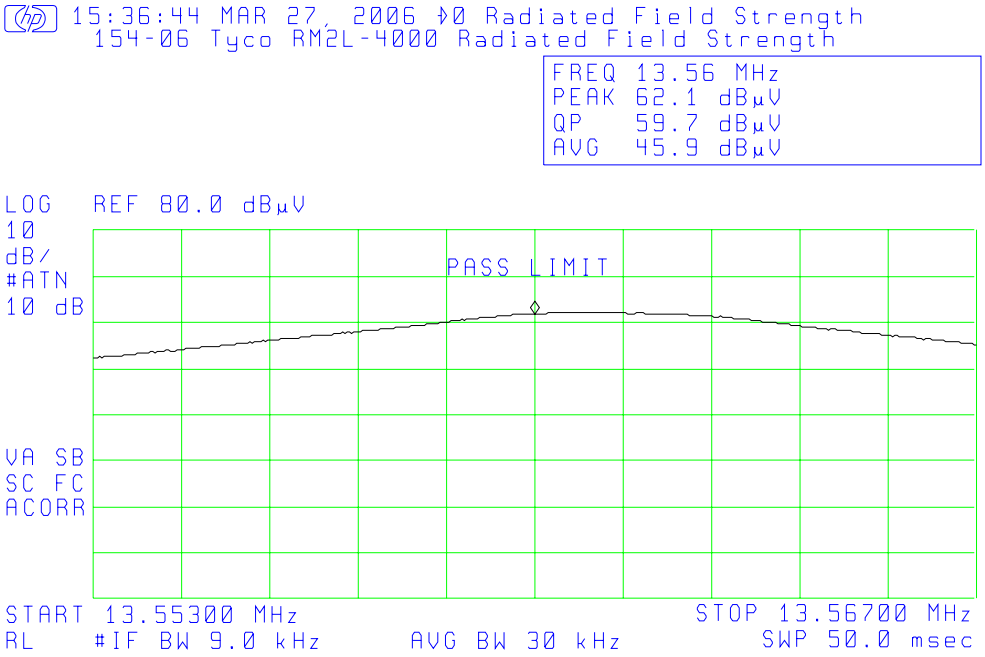
Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
27.1201	31.91	N/A	69.50[1]	-37.59	100	4	Loop Antenna
40.5478	30.01	24.47	40.00	-15.53	100	354	Vertical
54.3705	21.99	17.11	40.00	-22.89	100	354	Vertical
67.7303	28.71	23.24	40.00	-16.76	100	4	Vertical
81.4766	23.01	18.06	40.00	-21.94	100	354	Vertical
94.9200	30.53	27.00	43.50	-16.50	100	354	Vertical/Strong ambient
108.4800	34.64	14.90	43.50	-28.60	100	354	Vertical
122.1331	39.02	9.71	43.50	-33.79	100	354	Vertical
135.5435	26.79	21.88	43.50	-21.62	100	354	Vertical

[1]Limit was extrapolated to 3 meters.

7.2 Radiated Output Power & Occupied Bandwidth Test Results

Frequency Range:	13.553-13.567 MHz.
Measurement Distance:	3.0 Meters.
Bandwidth:	As Noted, Per ANSI C63.4-2003.
Detector Functions:	Peak, Quasi Peak, Average.
Video Filter:	Auto
Table Height:	0.8 meters
Antenna Height Variation:	1 Meter.

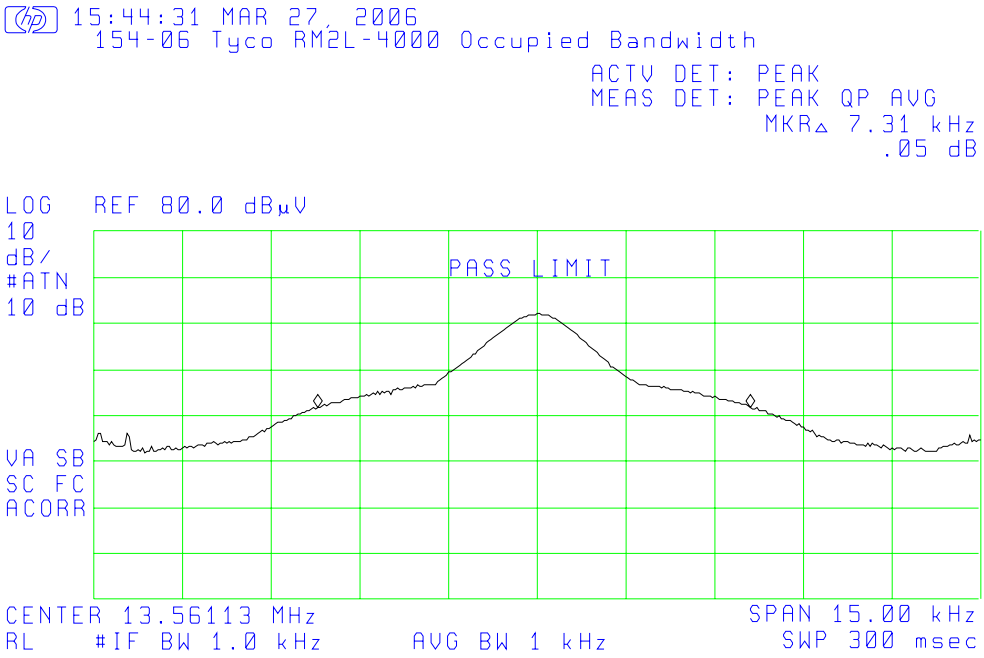
7.2.1 Output Power Plot



Freq (MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)
13.5600	62.1	124.0	-61.9

Note: Limit is extrapolated from 30m to 3m by adding 40dB.

7.2.2 Occupied Bandwidth Plot



99% Power BW (kHz)
7.31

7.3 Frequency Stability Test Results

Frequency Range: 13.553-13.567 MHz.

Measurement Distance: 1 Meter

The EUT was monitored for frequency stability in a controlled temperature environment ranging from –20°C to +50°C. It was operated at the nominal operating voltage. The worst case tolerance was +950 Hz or . 0.00703% at -20°C. This is within the required tolerance limit for stability of +/- 1.356 kHz or +/- 0.01% of 13.560 MHz.

The EUT was also monitored at 85% and 115% of the nominal operating voltage and found to be well within the required +/- 0.01% tolerance limit.

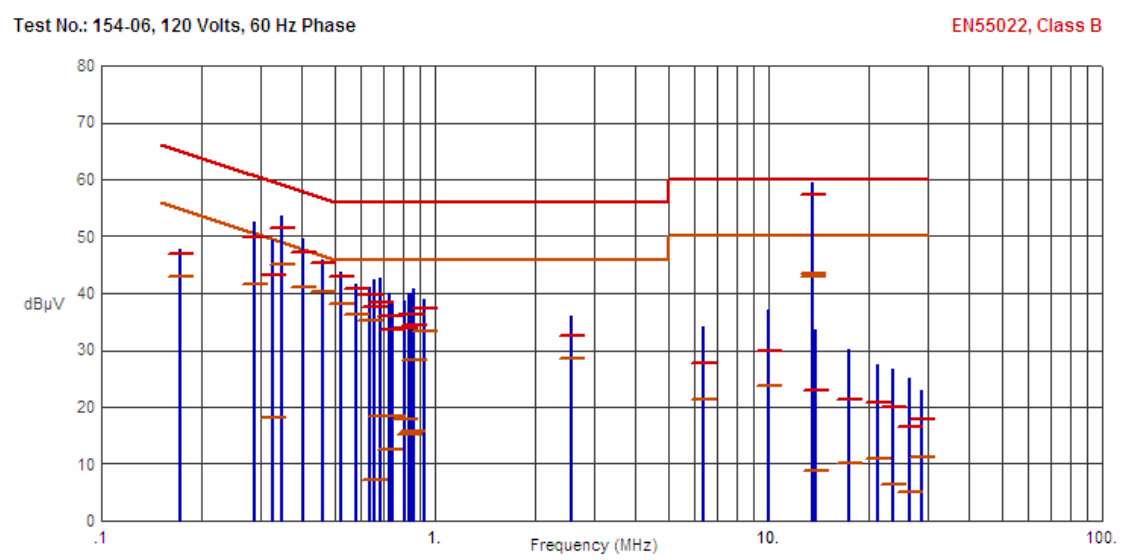
7.4 Conducted Emissions Test Results

Frequency Range:	150 kHz to 30.0 MHz.
Bandwidth:	9 kHz per ANSI C63.4-2003.
Detector Functions:	Peak, Quasi-Peak, Average
Table Height:	0.8 meters
Video Bandwidth:	30 kHz.

Phase and Neutral Measurements Taken.

Please see the following pages for conducted emissions test data.

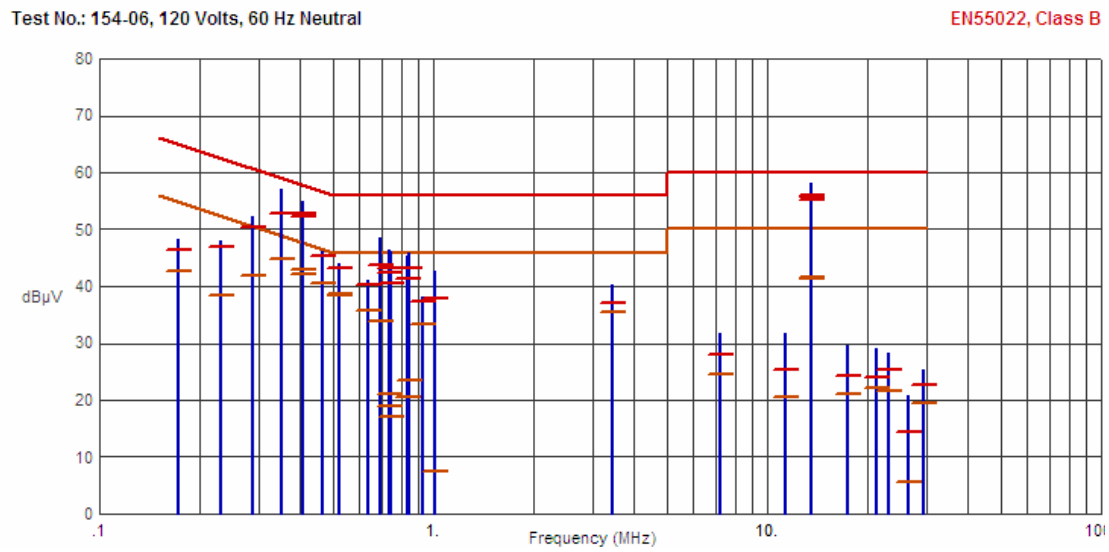
7.4.1 Conducted Emissions, 120V 60Hz Phase Data Log Plot



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1724	47.63	46.91	64.84	-17.93	43.05	54.84	-11.79	
.2871	52.46	49.87	60.61	-10.74	41.50	50.61	-9.11	
.3261	49.25	43.29	59.55	-16.26	18.05	49.55	-31.50	
.3472	53.50	51.37	59.03	-7.66	44.96	49.03	-4.07	
.4035	49.59	47.20	57.78	-10.58	41.12	47.78	-6.66	
.4613	45.90	45.23	56.67	-11.44	40.24	46.67	-6.43	
.5201	43.73	42.92	56.00	-13.08	38.17	46.00	-7.83	
.5773	41.65	40.86	56.00	-15.14	36.38	46.00	-9.62	
.6359	40.96	39.63	56.00	-16.37	35.19	46.00	-10.81	
.6587	42.48	37.57	56.00	-18.43	7.28	46.00	-38.72	
.6844	42.75	38.37	56.00	-17.63	18.48	46.00	-27.52	
.7322	40.04	35.97	56.00	-20.03	12.57	46.00	-33.43	
.7470	38.55	33.60	56.00	-22.40	18.27	46.00	-27.73	
.8133	38.70	33.87	56.00	-22.13	17.87	46.00	-28.13	
.8400	39.88	36.32	56.00	-19.68	15.07	46.00	-30.93	
.8570	39.88	36.25	56.00	-19.75	15.75	46.00	-30.25	
.8667	40.70	34.30	56.00	-21.70	28.27	46.00	-17.73	
.9259	38.85	37.39	56.00	-18.61	33.44	46.00	-12.56	
2.5518	35.94	32.46	56.00	-23.54	28.53	46.00	-17.47	
6.3771	34.19	27.85	60.00	-32.15	21.20	50.00	-28.80	
10.0299	37.16	29.78	60.00	-30.22	23.75	50.00	-26.25	
13.5614	59.51	57.40	60.00	-2.60	43.59	50.00	-6.41	
13.5618	59.24	57.32	60.00	-2.68	43.04	50.00	-6.96	
13.8594	33.71	23.06	60.00	-36.94	8.92	50.00	-41.08	
17.4018	30.19	21.31	60.00	-38.69	10.24	50.00	-39.76	
21.2704	27.39	20.78	60.00	-39.22	10.95	50.00	-39.05	
23.6329	26.57	19.87	60.00	-40.13	6.45	50.00	-43.55	
26.5347	25.10	16.43	60.00	-43.57	4.96	50.00	-45.04	
28.6526	23.05	17.90	60.00	-42.10	11.21	50.00	-38.79	

Compliance Worldwide, Inc. – 357 Main Street – Sandown, NH 03873
Phone (603) 887-3903 Fax 887-6445
http://www.cw-inc.com

7.4.2 Conducted Emissions, 120V 60Hz Neutral Data Log Plot



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1726	48.24	46.27	64.83	-18.56	42.75	54.83	-12.08	
.2320	47.91	46.97	62.38	-15.41	38.47	52.38	-13.91	
.2882	52.22	50.51	60.58	-10.07	41.86	50.58	-8.72	
.3495	57.05	52.86	58.97	-6.11	44.69	48.97	-4.28	
.4055	54.92	52.84	57.74	-4.90	42.98	47.74	-4.76	
.4081	54.73	52.26	57.69	-5.43	42.13	47.69	-5.56	
.4644	46.04	45.42	56.61	-11.19	40.48	46.61	-6.13	
.5219	43.95	43.22	56.00	-12.78	38.61	46.00	-7.39	
.5226	43.91	43.08	56.00	-12.92	38.50	46.00	-7.50	
.6378	41.06	40.20	56.00	-15.80	35.82	46.00	-10.18	
.6968	48.40	43.60	56.00	-12.40	33.79	46.00	-12.21	
.7355	46.34	43.20	56.00	-12.80	21.07	46.00	-24.93	
.7410	46.32	42.48	56.00	-13.52	18.86	46.00	-27.14	
.7477	46.18	40.43	56.00	-15.57	17.17	46.00	-28.83	
.8408	45.43	41.40	56.00	-14.60	20.48	46.00	-25.52	
.8501	45.95	43.12	56.00	-12.88	23.36	46.00	-22.64	
.9283	38.25	37.28	56.00	-18.72	33.28	46.00	-12.72	
1.0058	42.62	37.77	56.00	-18.23	7.52	46.00	-38.48	
3.4347	40.19	37.14	56.00	-18.86	35.35	46.00	-10.65	
7.2545	31.63	28.06	60.00	-31.94	24.45	50.00	-25.55	
11.3212	31.66	25.23	60.00	-34.77	20.61	50.00	-29.39	
13.5609	58.07	55.92	60.00	-4.08	41.64	50.00	-8.36	
13.5617	57.98	55.80	60.00	-4.20	41.46	50.00	-8.54	
13.5627	57.10	55.21	60.00	-4.79	41.29	50.00	-8.71	
17.3555	29.59	24.34	60.00	-35.66	20.96	50.00	-29.04	
21.1536	29.01	24.02	60.00	-35.98	22.03	50.00	-27.97	
23.0105	28.18	25.44	60.00	-34.56	21.72	50.00	-28.28	
26.4250	20.68	14.28	60.00	-45.72	5.71	50.00	-44.29	
29.4669	25.42	22.67	60.00	-37.33	19.43	50.00	-30.57	

8. Photographs

8.1 Radiated Emissions Test Setup.

8.2 Conducted Emissions Test Setup.

8.3 Frequency Stability Test Setup.