COMPLIANCE WORLDWIDE INC
TEST REPORT 151-06

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-IC
Proximity Card Reader with Keypad and LCD Display

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

on

March 31, 2006

Brian F. Breault

Reviewed by

Larry K. Stillings

Table of Contents

1. Test Description

1.1 Test Objective

To test the RM2L-IC 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-IC 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-IC

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 Procedures

3.1 Measurement Equipment

Device	Manufacturer	Model	Serial #	Cal. Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	1/5/2007
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):s
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- IC

Serial Number: Pre-production unit

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-IC to make continuous reads.

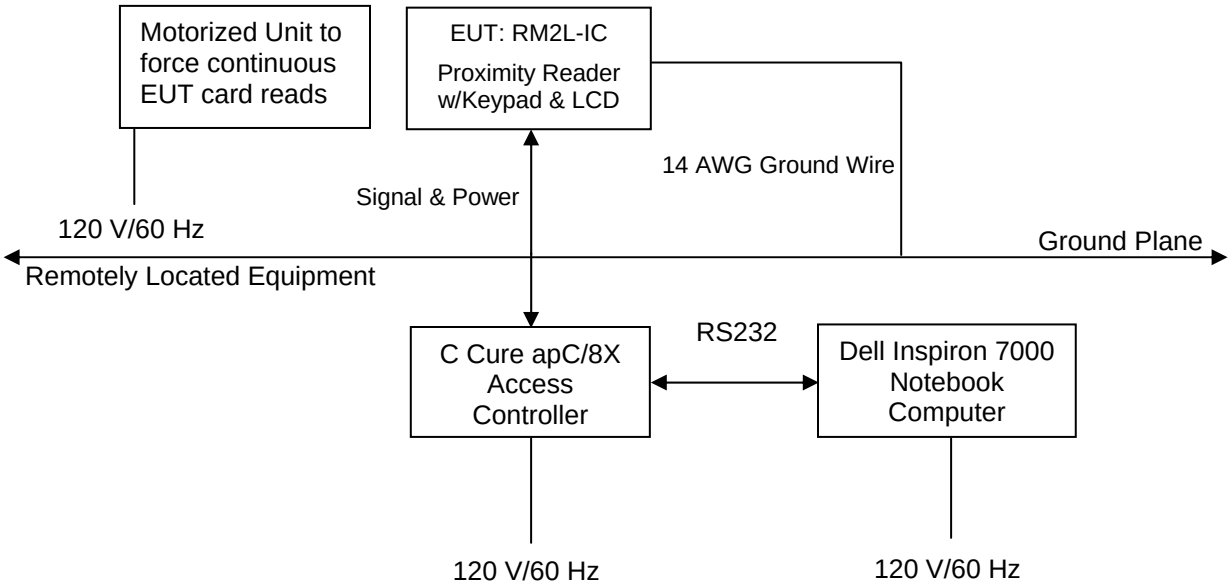
Support Equipment:

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

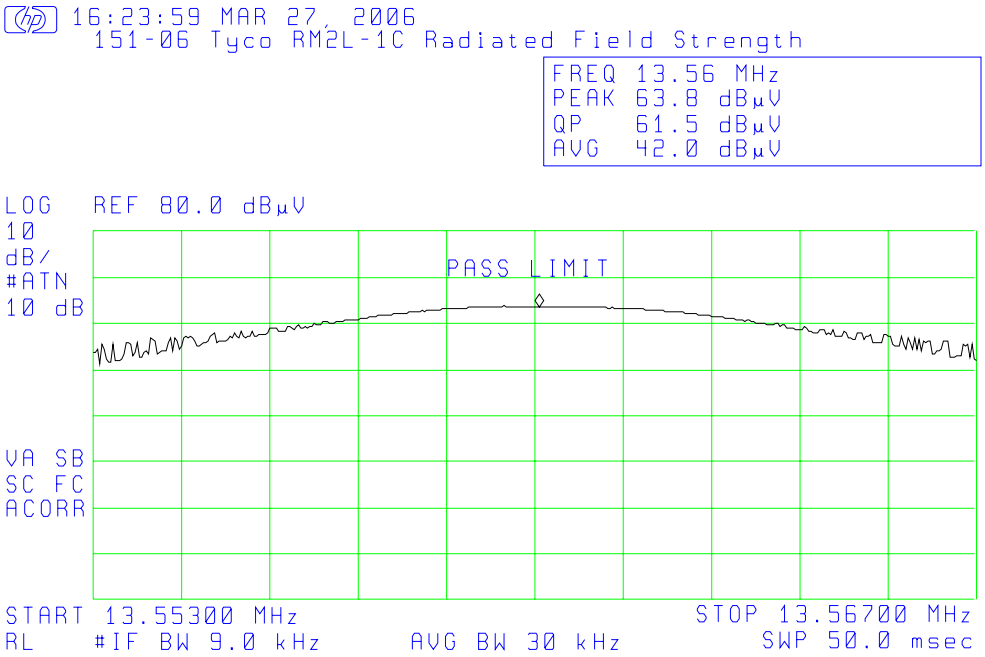
Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
27.1300	28.60	N/A	69.50[1]	-40.90	100	4	Loop Antenna
40.5898	29.40	24.17	40.00	-15.83	100	354	Vertical
54.3471	20.54	17.67	40.00	-22.33	100	354	Vertical
67.7071	31.37	26.50	40.00	-13.50	100	4	Vertical
81.4885	28.44	15.21	40.00	-24.79	100	354	Vertical
94.9200	30.74	29.00	43.50	-11.00	100	354	Vertical/Strong ambient
108.4350	27.74	19.00	43.50	-24.50	100	354	Vertical
122.0215	30.27	25.97	43.50	-17.53	100	354	Vertical
135.5045	23.14	16.46	43.50	-27.04	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.

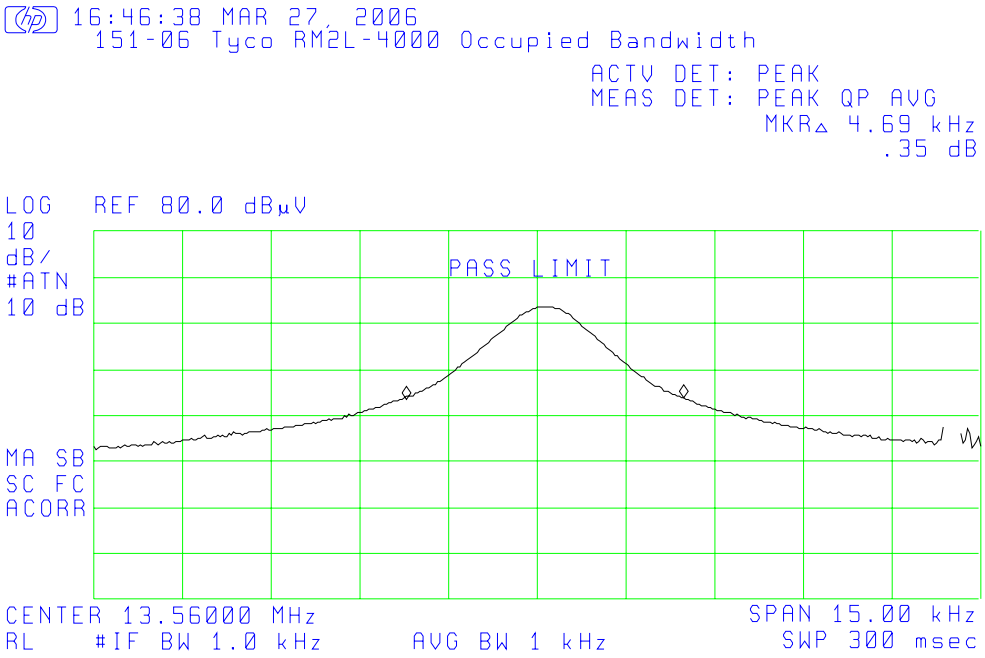
7.2.1 Output Power Plot



Freq (MHz)	Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)
13.5600	63.8	124.0	-60.2

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

7.2.2 Occupied Bandwidth Plot



99% Power BW (kHz)
4.69

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 -310 Hz or . 0.0023% at +50°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.

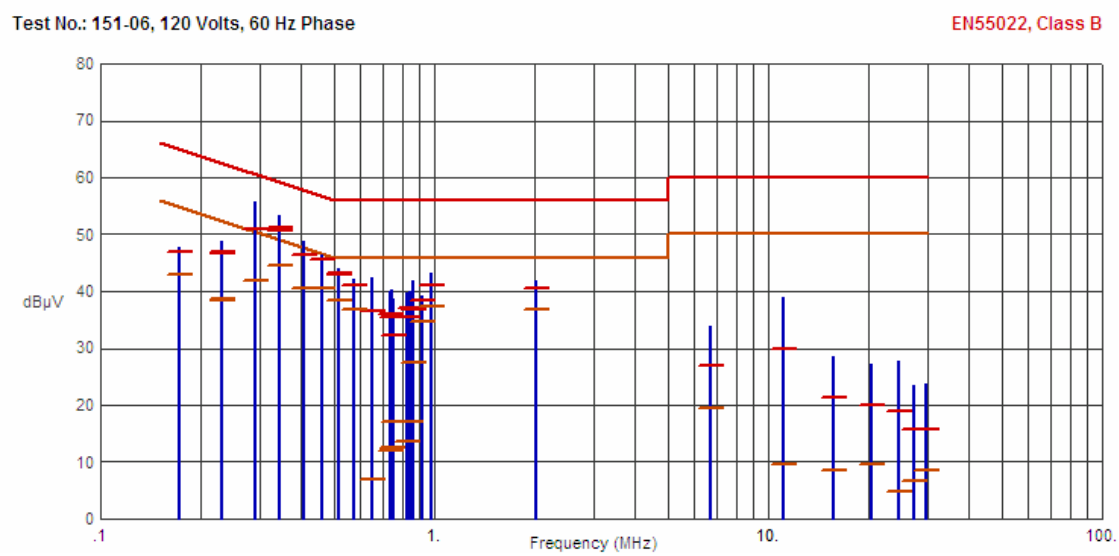
7.4 Conducted Emissions Test Results

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
.1722	47.68	46.92	64.85	-17.93	43.03	54.85	-11.82	
.2303	48.75	46.95	62.44	-15.49	38.66	52.44	-13.78	
.2311	47.31	46.70	62.41	-15.71	38.41	52.41	-14.00	
.2904	55.64	50.97	60.51	-9.54	41.91	50.51	-8.60	
.3447	52.96	50.80	59.09	-8.29	44.47	49.09	-4.62	
.3450	53.25	51.24	59.08	-7.84	44.55	49.08	-4.53	
.4057	48.80	46.39	57.74	-11.35	40.50	47.74	-7.24	
.4612	46.28	45.64	56.67	-11.03	40.54	46.67	-6.13	
.5185	43.79	43.14	56.00	-12.86	38.34	46.00	-7.66	
.5191	44.08	42.99	56.00	-13.01	38.40	46.00	-7.60	
.5768	42.24	41.20	56.00	-14.80	36.76	46.00	-9.24	
.6530	42.38	36.42	56.00	-19.58	6.98	46.00	-39.02	
.7375	39.91	36.05	56.00	-19.95	11.90	46.00	-34.10	
.7427	40.26	35.45	56.00	-20.55	12.53	46.00	-33.47	
.7547	38.62	32.39	56.00	-23.61	17.04	46.00	-28.96	
.8317	39.69	35.36	56.00	-20.64	13.73	46.00	-32.27	
.8449	40.10	36.94	56.00	-19.06	16.97	46.00	-29.03	
.8629	41.86	36.89	56.00	-19.11	27.49	46.00	-18.51	
.9231	39.08	38.42	56.00	-17.58	34.64	46.00	-11.36	
.9811	43.12	41.17	56.00	-14.83	37.40	46.00	-8.60	
2.0199	41.91	40.52	56.00	-15.48	36.93	46.00	-9.07	
6.6983	33.77	27.03	60.00	-32.97	19.34	50.00	-30.66	
11.1593	38.97	30.00	60.00	-30.00	9.57	50.00	-40.43	
15.7110	28.53	21.33	60.00	-38.67	8.48	50.00	-41.52	
20.2886	27.31	20.05	60.00	-39.95	9.56	50.00	-40.44	
24.4963	27.63	18.99	60.00	-41.01	4.91	50.00	-45.09	
27.3752	23.54	15.72	60.00	-44.28	6.74	50.00	-43.26	
29.7250	23.62	15.67	60.00	-44.33	8.47	50.00	-41.53	

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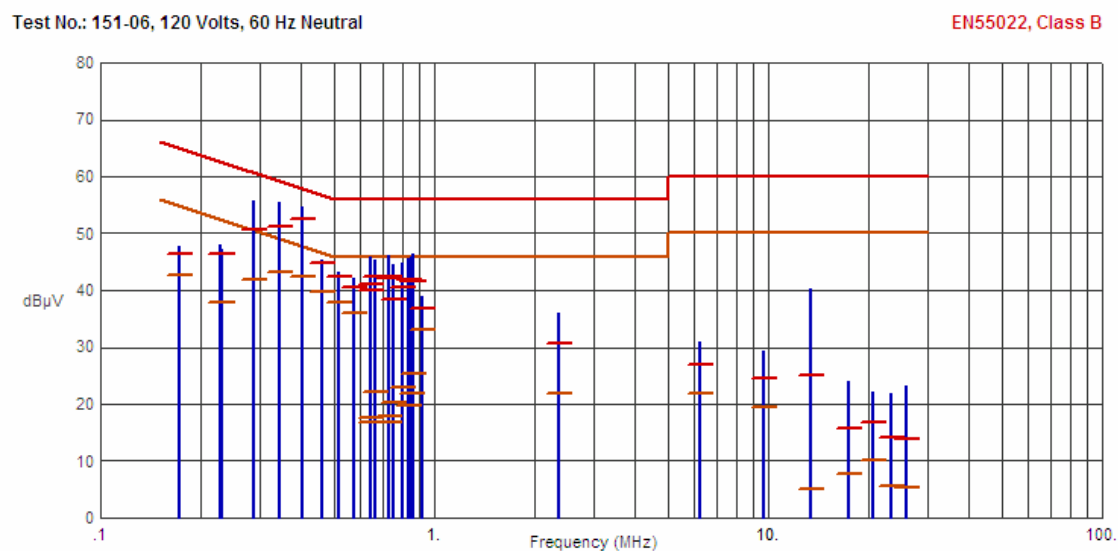
http://www.cw-inc.com

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
.1722	47.82	46.51	64.85	-18.34	42.54	54.85	-12.31	
.2298	47.96	46.48	62.46	-15.98	37.99	52.46	-14.47	
.2309	47.14	46.32	62.42	-16.10	37.83	52.42	-14.59	
.2871	55.76	50.76	60.61	-9.85	41.79	50.61	-8.82	
.3433	55.37	51.18	59.12	-7.94	43.28	49.12	-5.84	
.4017	54.65	52.43	57.82	-5.39	42.47	47.82	-5.35	
.4026	54.76	52.46	57.80	-5.34	42.32	47.80	-5.48	
.4594	45.36	44.68	56.70	-12.02	39.62	46.70	-7.08	
.5182	43.33	42.38	56.00	-13.62	37.79	46.00	-8.21	
.5757	42.09	40.47	56.00	-15.53	35.97	46.00	-10.03	
.6413	45.86	40.12	56.00	-15.88	17.58	46.00	-28.42	
.6424	45.65	41.20	56.00	-14.80	16.69	46.00	-29.31	
.6663	45.45	42.40	56.00	-13.60	22.25	46.00	-23.75	
.7300	46.11	42.15	56.00	-13.85	16.86	46.00	-29.14	
.7340	46.22	42.32	56.00	-13.68	17.79	46.00	-28.21	
.7518	44.60	38.38	56.00	-17.62	20.26	46.00	-25.74	
.8036	44.67	40.60	56.00	-15.40	22.84	46.00	-23.16	
.8371	45.59	41.97	56.00	-14.03	19.86	46.00	-26.14	
.8589	45.83	41.71	56.00	-14.29	21.80	46.00	-24.20	
.8608	46.44	41.62	56.00	-14.38	25.25	46.00	-20.75	
.9229	38.95	36.78	56.00	-19.22	32.94	46.00	-13.06	
2.3642	36.00	30.55	56.00	-25.45	21.81	46.00	-24.19	
6.2218	30.88	26.95	60.00	-33.05	21.82	50.00	-28.18	
9.6676	29.46	24.45	60.00	-35.55	19.47	50.00	-30.53	
13.4244	40.21	25.01	60.00	-34.99	4.96	50.00	-45.04	
17.3565	24.11	15.75	60.00	-44.25	7.80	50.00	-42.20	
20.5050	22.18	16.85	60.00	-43.15	10.15	50.00	-39.85	
23.3955	21.74	14.12	60.00	-45.88	5.69	50.00	-44.31	
25.9543	23.20	13.84	60.00	-46.16	5.29	50.00	-44.71	

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8. Photographs

8.1 Radiated Emissions Test Setup.

8.2 Conducted Emissions Test Setup.

8.3 Frequency Stability Test Setup.