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FCC Certification Test Report

MEI

EASICHOICE 4 IN 1+" CREDIT CARD BEZEL

WLL REPORT# **13172-01 Rev 1**
October 10, 2013
Revised October 21 ,2013

FCC ID: QP8MEICARD3B

Prepared for:

MEI
3222 Phoenixville Pike - Ste 200
Malvern, PA, 19355

Prepared By:

Washington Laboratories, Ltd.
7560 Lindbergh Drive
Gaithersburg, Maryland 20879

Testing Certificate AT-1448

FCC Certification Test Report

For the

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FCC ID: QP8MEICARD3B

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Prepared by:

James Ritter
EMC Compliance Engineer

Reviewed by:

Steven D. Koster
Vice President

Abstract

This report has been prepared on behalf of MEI to support the attached Application for Equipment Authorization. The test report and application are submitted for an Intentional Radiator under Part 15.225 of the FCC Rules This Certification Test Report documents the test configuration and test results for a EasiChoice 4 in 1+" Credit Card Bezel.

Testing was performed on an Open Area Test Site (OATS) of Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by ACLASS under Certificate AT-1448 as an independent FCC test laboratory.

These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by the ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1448.

The EasiChoice 4 in 1+" Credit Card Bezel complies with the limits for an Intentional Radiator device under FCC Part 15.225.

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Revision History	Reason	Date
Rev 0	Initial Release	October 10, 2012
Rev 1	Corrected Bandwidth listed in Table from 933kHz to 933 Hz	October 21, 2013 JR

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1.1 Compliance Statement

The EasiChoice 4 in 1+" Credit Card Bezel complies with the limits for an Intentional Radiator device under FCC Part 15.225 (10/2012).

1.2 Test Scope Summary

Tests for radiated and conducted emissions were performed. All measurements were performed in accordance with the 2003 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

Test Specification	Specific Description	Date Completed	Result	Modifications (Y/N)
CFR47 Part 15.207,	Class B Conducted Emissions – AC Power Ports	10/8/13	Complied	No
CFR47 Part 15.209,	Class B Radiated Emissions	10/8/13	Complied	No
CFR47 Part 15.225,	Field Strength	10/8/13	Complied	No
CFR47 Part 15.225,	Frequency Stability	10/9/13	Complied	No
CFR47 Part 2.1049	Occupied Bandwidth	10/8/13	Complied	No

1.3 Contract Information

Customer:	MEI 3222 Phoenixville Pike - Ste 200 Malvern, PA, 19355
Purchase Order Number:	4500266785
Quotation Number:	67717

1.4 Test Dates

Testing was performed on the following date(s):	10/8/2013- 10/9/2013

1.5 Test and Support Personnel

Washington Laboratories, LTD	James Ritter
Client Representative	Robert Carney

1.6 Abbreviations

A	**A**mpere
ac	**a**lternating **c**urrent
AM	Amplitude Modulation
Amps	**Amp**ere**s**
b/s	**b**its per **s**econd
BW	**B**and**W**idth
CE	**C**onducted **E**mission
cm	**c**enti**m**eter
CW	**C**ontinuous **W**ave
dB	**d**eci**B**el
dc	**d**irect **c**urrent
EMI	**E**lectro**m**agnetic **I**nterference
EUT	**E**quipment **U**nder **T**est
FM	**F**requency **M**odulation
G	**g**iga - prefix for 10^9 multiplier
Hz	**H**ertz
IF	**I**ntermediate **F**requency
k	**k**ilo - prefix for 10^3 multiplier
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
M	**M**ega - prefix for 10^6 multiplier
m	**m**eter
µ	**m**icro - prefix for 10^{-6} multiplier
NB	**N**arrow**b**and
QP	**Q**uasi-**P**eak
RE	**R**adiated **E**missions
RF	**R**adio **F**requency
rms	**r**oot-**m**ean-**s**quare
SN	**S**erial **N**umber
S/A	**S**pectrum **A**nalyzer
V	**V**olt

2 Equipment Under Test

2.1 EUT Identification & Description

The MEI "EasiChoice 4 in 1+" Credit Card Bezel is used in the vending industry to author magnetic stripe, contact (EMV) & contactless (RFID) credit cards in support of unattended sales. Mechanically it can mount to the front of the MEI Series 2000 bill acceptor or be operated standalone. The RFID emission can accommodate various card type protocols and is based on ISO 14443 standard with a carrier center frequency of 13.56 MHz in support of cashless RFID credit card authorization.

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Table 1. Device Summary

ITEM	DESCRIPTION
Manufacturer:	MEI
FCC ID:	QP8MEICARD3B
Model:	EasiChoice 4 in 1+" Credit Card Bezel
FCC Rule Parts:	§15.225
Frequency Range:	13.56MHz
Maximum Output Power:	351.8 uV/m at 10 meters
Modulation:	ASK
Occupied Bandwidth:	933Hz
Type of Information:	Data
Number of Channels:	1
Power Output Level	Fixed
Antenna Type	Internal PCB
Frequency Tolerance:	>±0.01% (±100 ppm)
Interface Cables:	Power, I/O
Power Source & Voltage:	5Vdc from Host device

2.2 Test Configuration

The EasiChoice 4 in 1+" Credit Card Bezel was configured for testing as indicated in the figure below. Power from a support 115 VAC to 5VDC power adaptor (EUT normally receives 5VDC from host unit) was provided to EUT. In addition a RS232 (DB9) line was connected between the EUT and a support laptop. No other connections were necessary.

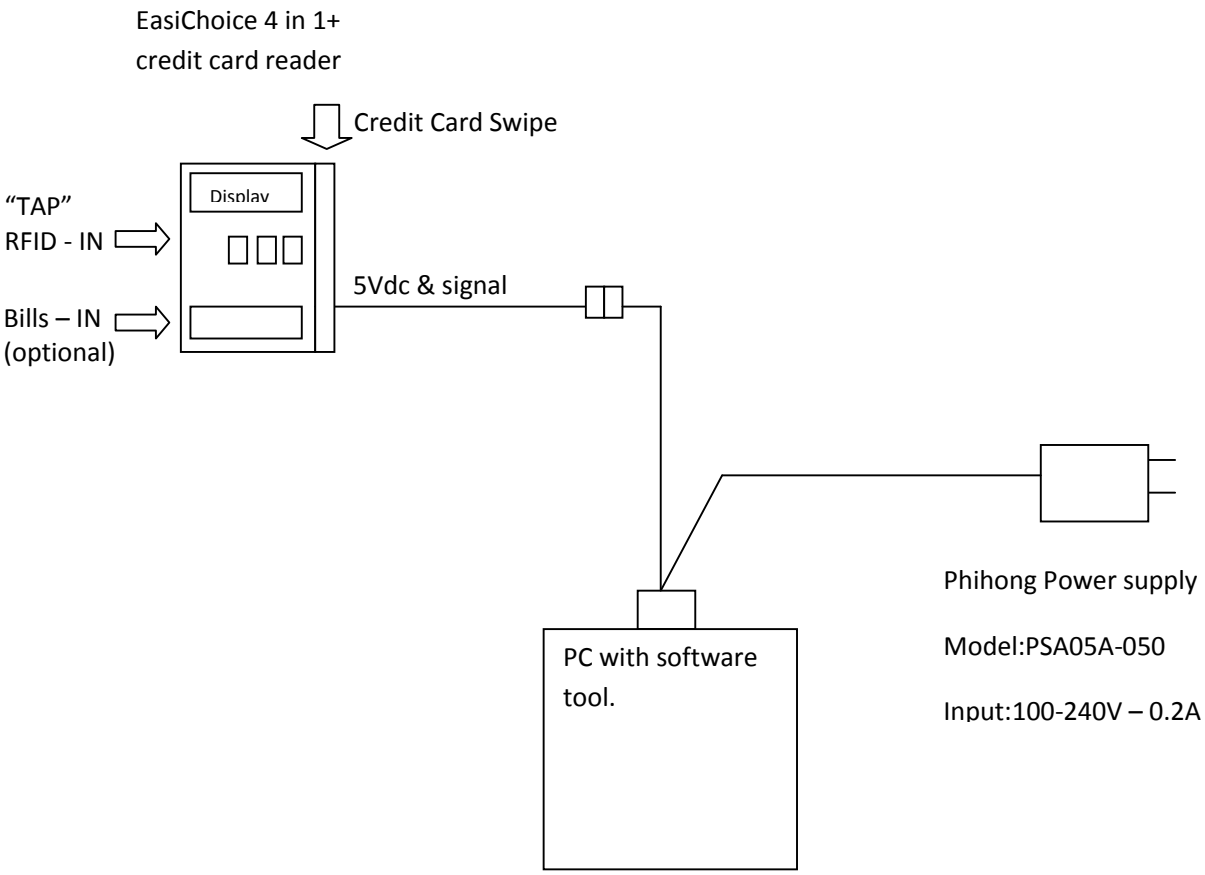

Figure 1: Test Configuration

2.3 Testing Algorithm

The Reader operates at a fixed frequency of 13.56MHz. A support laptop sent commands via RS232 to continuously transmit characters using "MEIVendiPayFCCTest.exe" test utility program.

2.4 Measurements

2.4.1 References

ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz

Land Mobile FM or PM Communications Equipment Measurement and Performance Standards (ANSI/TIA/EIA-603-93)

2.5 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Gaithersburg, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by ACLASS under Certificate AT-1448 as an independent FCC test laboratory.

2.6 Measurement Uncertainty

All results reported herein relate only to the equipment tested. The basis for uncertainty calculation uses ANSI/NCSL Z540-2-1997 with a type B evaluation of the standard uncertainty. Elements contributing to the standard uncertainty are combined using the method described in Equation 1 to arrive at the total standard uncertainty. The standard uncertainty is multiplied by the coverage factor to determine the expanded uncertainty which is generally accepted for use in commercial, industrial, and regulatory applications and when health and safety are concerned (see Equation 2). A coverage factor was selected to yield a 95% confidence in the uncertainty estimation.

Equation 1: Standard Uncertainty

$$u_c = \pm\sqrt{\frac{a^2}{div_a{}^2} + \frac{b^2}{div_b{}^2} + \frac{c^2}{div_c{}^2} + ...}$$

where u_c = standard uncertainty

a, b, c,.. = individual uncertainty elements

$div_{a,\ b,\ c}$ = the individual uncertainty element divisor based on the probability distribution

divisor = 1.732 for rectangular distribution

divisor = 2 for normal distribution

divisor = 1.414 for trapezoid distribution

Equation 2: Expanded Uncertainty

$$U = ku_c$$

where U = expanded uncertainty

k = coverage factor

k ≤ 2 for 95% coverage (ANSI/NCSL Z540-2 Annex G)

u_c = standard uncertainty

The measurement uncertainty complies with the maximum allowed uncertainty from CISPR 16-4-2. Measurement uncertainty is not used to adjust the measurements to determine compliance. The expanded uncertainty values for the various scopes in the WLL accreditation are provided in Table 2 below.

Table 2: Expanded Uncertainty List

Scope	Standard(s)	Expanded Uncertainty
Conducted Emissions	CISPR11, CISPR22, CISPR14, FCC Part 15	2.63 dB
Radiated Emissions	CISPR11, CISPR22, CISPR14, FCC Part 15	4.55 dB

3 Test Equipment

Table 3 shows a list of the test equipment used for measurements along with the calibration information.

Table 3: Test Equipment

Test Name: **Radiated Emissions**			Test Date: **10/08/2013**
Asset #	**Manufacturer/Model**	**Description**	**Cal. Due**
528	AGILENT - E4446A	ANALYZER SPECTRUM	2/28/2014
31	EMCO - 6502	ANTENNA ACTIVE LOOP	2/23/2014
69	HP - 85650A	ADAPTER QP	3/30/2014
802	HP - 8568B	SPECTRUM ANALYZER	3/30/2014
71	HP - 85685A	PRESELECTOR RF	3/30/2014
382	SUNOL SCIENCES CORPORATION - JB1	ANTENNA BICONLOG	12/26/2014

Test Name: **Conducted Emissions Voltage**			Test Date: **10/08/2013**
Asset #	**Manufacturer/Model**	**Description**	**Cal. Due**
69	HP - 85650A	ADAPTER QP	3/30/2014
802	HP - 8568B	SPECTRUM ANALYZER	3/30/2014
71	HP - 85685A	PRESELECTOR RF	3/30/2014
125	SOLAR - 8028-50-TS-24-BNC	LISN	6/11/2014
126	SOLAR - 8028-50-TS-24-BNC	LISN	6/11/2014

Test Name: **Temperature Stability**			Test Date: **10/9/2013**
Asset #	Manufacturer/Model	Description	Cal. Due
00728	AGILENT - 8564EC	SPECTRUM ANALYZER 30HZ - 40GHZ	5/22/2014
776	TENNY - TJR-A-WS4	1.22 CUFT	1/28/2014
00093	KIKISUI - PCR2000L	SUPPLY POWER AC/DC	7/18/2014

4 Test Results

4.1 Occupied Bandwidth

Occupied bandwidth measurement was performed by coupling the output of the EUT to the input of a spectrum analyzer using a near field probe.

The occupied bandwidth was measured as shown:

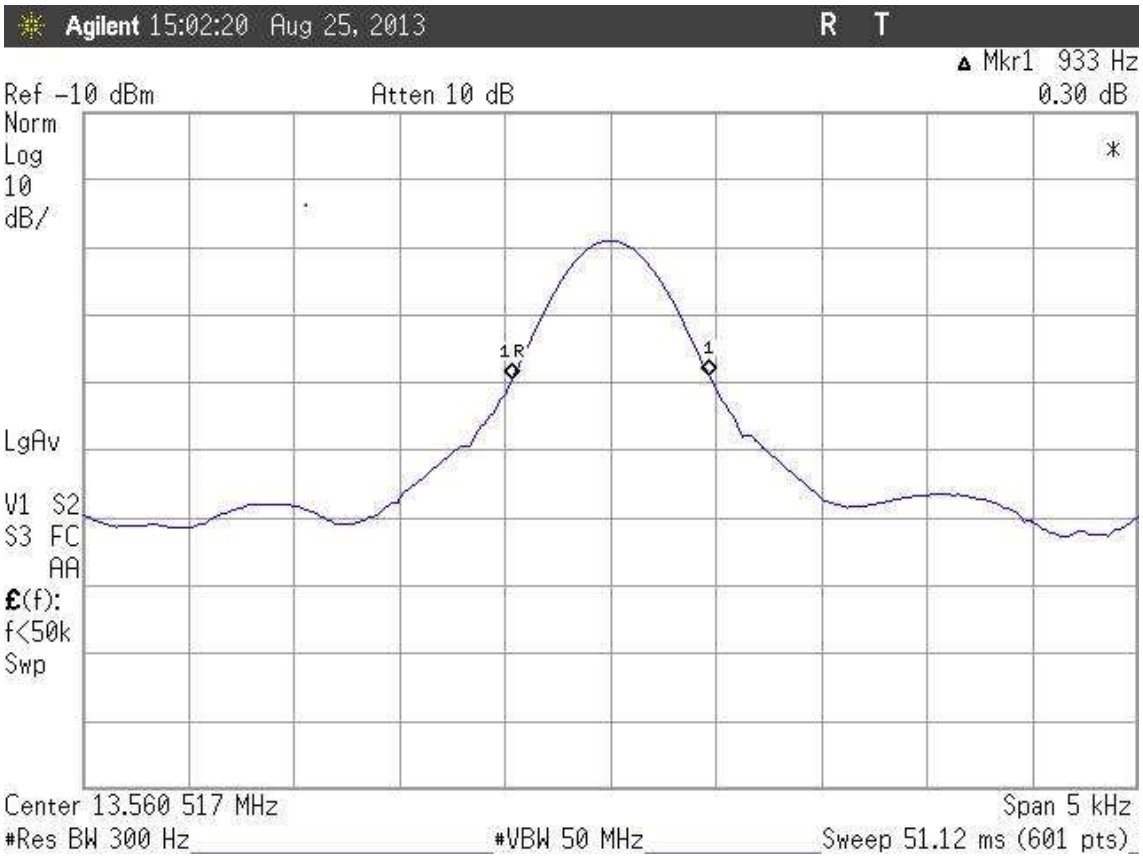

Figure 2: Occupied Bandwidth

Table 3 provides a summary of the Occupied Bandwidth Results.

Table 4: Occupied Bandwidth Results

Frequency	Bandwidth	Limit	Pass/Fail
13.560MHz	933 Hz	N/A	Pass

4.2 Radiated Spurious Emissions: FCC §15.225, §15.209

Radiated emissions from the EUT must comply with the field strength limits as specified in FCC Part 15.225 and 15.209. The limits for the radiated emissions are as shown in the following table.

Table 5: Radiated Spurious Emissions Limits

Frequency (MHz)	Limit (μV/m)	Rule Part Reference
13.553 - 13.567	15,848 (@ 30m)	§15.225(a)
13.410 – 13.553	334 (@ 30m)	§15.225(b)
13.567 – 13.710	334 (@ 30m)	§15.225(b)
13.110 – 13.410	106 (@ 30m)	§15.225(c)
13.710 – 14.010	106 (@ 30m)	§15.225(c)
1.705 – 13.110 14.010 – 30.0	30 (@ 30m)	§15.225(d)
30.00 – 88.00	100 (@ 3m)	§15.225(d)
88.00 – 216.00	150 (@ 3m)	§15.225(d)
216.00 – 960.00	200 (@ 3m)	§15.225(d)
Above 960	500 (@ 3m)	§15.225(d)

4.1.1 Test Procedure

The EUT was placed on motorized turntable for radiated testing on an Open Area Test Site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. For frequencies below 30MHz, the loop antenna was mounted on a tripod at a height of 1 meter and a distance of 10m from the EUT. Above 30MHz, Biconical and log periodic broadband receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters at a distance of 3 meters from the EUT. The peripherals were placed on the table in accordance with ANSI C63.4-2003. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured

Below 150kHz, bandwidths used were 300Hz RBW and 10kHz VBW. Between 150 kHz and 30MHz, bandwidths used were 10kHz RBW and 30kHz VBW. Limits were interpolated from the 30 meter limit to the equivalent at 10 meters using the 40dB/decade roll-off. Three orientations of the loop antenna were tested. Above 30MHz, bandwidths used were 100kHz RBW and 30kHz VBW.

Emissions were scanned from 9 kHz to 1GHz. Emissions from were measured using a Quasi-peak detector. Worst case emissions are reported in the data table.

The following is a sample calculation used in the data tables for calculating the final field strength of spurious emissions and comparing these levels to the specified limits.

Sample Calculation:

Spectrum Analyzer Voltage (SA Level):	VdBμV
Antenna Factor (Ant Corr):	AFdB/m
Cable Loss Correction (Cable Corr):	CCdB
Amplifier Gain:	GdB (if applicable)
Electric Field (Corr Level):	EdBμV/m = VdBμV + AFdB/m + CCdB - GdB
To convert to linear units:	EμV/m = antilog (EdBμV/m/20)

4.1.2 Test Results

The EUT complies with the radiated emission requirements of §15.225. The following tables provide the test data.

Table 6: Radiated Emissions below 30MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
13.560	X	90.00	1.00	39.90	11.0	351.8	158480.0	-53.1	
13.560	Y	290.00	1.00	39.10	11.0	320.8	158480.0	-53.9	
13.560	Z	90.00	1.00	36.90	11.0	249.0	158480.0	-56.1	
27.121	X	270.00	1.00	10.30	9.4	9.7	300.0	-29.8	
27.121	Y	180.00	1.00	15.20	9.4	17.0	300.0	-24.9	
27.121	Z	45.00	1.00	16.70	9.4	20.2	300.0	-23.4	
13.553	X	180.00	1.00	11.10	11.0	12.8	3340.0	-48.3	bandedge
13.553	Y	0.00	1.00	17.50	11.0	26.7	3340.0	-41.9	bandedge
13.553	Z	95.00	1.00	6.90	11.0	7.9	3340.0	-52.5	bandedge
13.567	X	180.00	1.00	7.10	11.0	8.1	3340.0	-52.3	bandedge
13.567	Y	0.00	1.00	13.00	11.0	15.9	3340.0	-46.4	bandedge
13.567	Z	90.00	1.00	4.30	11.0	5.8	3340.0	-55.1	bandedge
11.190	X	80.00	1.00	2.70	10.9	4.8	300.0	-36.0	
11.190	Y	80.00	1.00	1.20	10.9	4.0	300.0	-37.5	
11.190	Z	80.00	1.00	1.50	10.9	4.2	300.0	-37.2	
13.495	X	90.00	1.00	7.90	11.0	8.8	3340.0	-51.6	
13.495	Y	0.00	1.00	7.10	11.0	8.1	3340.0	-52.4	
13.495	Z	270.00	1.00	10.00	11.0	11.2	3340.0	-49.5	
13.419	X	0.00	1.00	6.50	11.0	7.5	3340.0	-53.0	
13.419	Y	0.00	1.00	5.80	11.0	6.9	3340.0	-53.7	
13.419	Z	90.00	1.00	7.90	11.0	8.8	3340.0	-51.6	
13.632	X	0.00	1.00	5.80	11.0	6.9	3340.0	-53.6	
13.632	Y	270.00	1.00	5.90	11.0	7.0	3340.0	-53.5	
13.632	Z	10.00	1.00	7.10	11.0	8.1	3340.0	-52.3	
13.706	X	0.00	1.00	5.60	11.0	6.8	3340.0	-53.8	
13.706	Y	90.00	1.00	3.80	11.0	5.5	3340.0	-55.6	
13.706	Z	270.00	1.00	4.10	11.0	5.7	3340.0	-55.3	

Table 7: Radiated Emissions above 30MHz

Frequency (MHz)	Polarity H/V	Azimuth (Degree)	Ant. Height (m)	SA Level (dBuV)	Corr Factors (dB)	Corr. Level (uV/m)	Limit (uV/m)	Margin (dB)	Comments
35.000	V	45.00	1.00	10.50	18.3	27.6	100.0	-11.2	
40.680	V	90.00	1.00	9.80	14.3	16.0	100.0	-15.9	
48.900	V	90.00	1.00	9.50	9.3	8.7	100.0	-21.2	
54.237	V	180.00	1.10	11.40	8.2	9.5	100.0	-20.4	
54.600	V	0.00	1.10	14.20	8.2	13.2	100.0	-17.6	
81.360	V	45.00	1.10	8.20	9.1	7.3	100.0	-22.7	
108.463	V	270.00	1.17	7.10	13.8	11.0	150.0	-22.7	
132.710	V	90.00	1.30	15.30	15.2	33.6	150.0	-13.0	
135.600	V	340.00	1.50	4.60	15.0	9.5	150.0	-24.0	
221.186	V	45.00	50.00	13.10	12.9	20.0	200.0	-20.0	
243.312	V	90.00	1.45	10.40	13.9	16.4	200.0	-21.7	
244.090	V	350.00	1.35	4.80	13.9	8.6	200.0	-27.3	
265.430	V	90.00	1.90	9.60	15.1	17.3	200.0	-21.3	
309.670	V	45.00	1.61	6.50	16.2	13.7	200.0	-23.3	
331.810	V	0.00	1.48	8.10	16.7	17.4	200.0	-21.2	
508.756	V	270.00	1.69	8.50	21.3	30.9	200.0	-16.2	
707.845	V	45.00	1.90	5.90	24.3	32.3	200.0	-15.8	
818.446	V	45.00	1.00	6.80	25.6	41.7	200.0	-13.6	
906.931	V	270.00	1.28	5.20	26.9	40.4	200.0	-13.9	
48.540	H	0.00	4.00	9.20	9.5	8.6	100.0	-21.3	
54.240	H	45.00	4.00	11.90	8.2	10.1	100.0	-19.9	
63.240	H	90.00	4.00	12.20	8.8	11.3	100.0	-19.0	
66.337	H	0.00	4.00	10.20	9.2	9.3	100.0	-20.6	
81.359	H	50.00	4.00	9.90	9.1	8.9	100.0	-21.0	
132.711	H	90.00	3.34	11.90	15.2	22.7	150.0	-16.4	
135.600	H	290.00	3.36	5.50	15.0	10.6	150.0	-23.1	
154.829	H	0.00	2.80	9.60	14.0	15.1	150.0	-20.0	
221.189	H	45.00	1.95	15.90	12.9	27.7	200.0	-17.2	
243.307	H	90.00	1.60	17.50	13.9	37.0	200.0	-14.6	
244.089	H	180.00	2.57	6.90	13.9	11.0	200.0	-25.2	
265.425	H	45.00	1.60	14.50	15.1	30.4	200.0	-16.4	
309.680	H	0.00	1.40	11.90	16.2	25.5	200.0	-17.9	
575.115	H	45.00	1.64	9.70	22.6	41.3	200.0	-13.7	
707.843	H	45.00	1.40	7.90	24.3	40.7	200.0	-13.8	
906.942	H	90.00	1.10	5.60	26.9	42.4	200.0	-13.5	
951.160	H	90.00	1.30	8.60	26.9	59.2	200.0	-10.6	

4.2 Conducted Emissions (AC Power Line) FCC §15.207

The EUT was placed on an 80 cm high 1 x 1.5 m non-conductive table above a ground plane. Power to the EUT was provided through a Solar Corporation 50 Ω/50 µH Line Impedance Stabilization Network bonded to a 3 x 2 meter ground plane. The LISN has its AC input supplied from a filtered AC power source. Power and data cables were moved about to obtain maximum emissions.

The 50 Ω output of the LISN was connected to the input of the spectrum analyzer and the emissions in the frequency range of 150 kHz to 30 MHz were measured. The detector function was set to quasi-peak or peak, as appropriate, and the resolution bandwidth during testing was at least 9 kHz, with all post-detector filtering no less than 10 times the resolution bandwidth.

AC Power Line conducted emissions test data are included in Table 8.

Table 8: AC Power Conducted Emissions Test Data

NEUTRAL

Frequency (MHz)	Level QP (dBµV)	Level AVG (dBµV)	Cable Loss (dB)	LISN Corr (dB)	Level QP Corr (dBµV)	Level Corr Avg (dBµV)	Limit QP (dBµV)	Limit AVG (dBµV)	Margin QP (dB)	Margin AVG (dB)
0.195	37.6	27.2	10.1	0.2	47.9	37.5	63.8	53.8	-15.9	-16.3
0.393	31.5	29.3	10.1	0.3	41.9	39.7	58.0	48.0	-16.1	-8.3
1.768	27.6	20.4	10.4	0.3	38.3	31.1	56.0	46.0	-17.7	-14.9
2.490	25.5	22.2	10.6	0.3	36.4	33.1	56.0	46.0	-19.6	-12.9
8.110	30.6	24.6	11.2	0.1	41.9	35.9	60.0	50.0	-18.1	-14.1
13.560	33.8	32.0	11.4	0.5	45.7	43.9	60.0	50.0	-14.3	-6.1

PHASE

Frequency (MHz)	Level QP (dBµV)	Level AVG (dBµV)	Cable Loss (dB)	LISN Corr (dB)	Level QP Corr (dBµV)	Level Corr Avg (dBµV)	Limit QP (dBµV)	Limit AVG (dBµV)	Margin QP (dB)	Margin AVG (dB)
0.196	38.1	29.2	10.1	0.0	48.2	39.3	63.8	53.8	-15.5	-14.4
0.393	31.3	28.9	10.1	0.3	41.6	39.2	58.0	48.0	-16.4	-8.8
1.768	24.7	20.5	10.4	0.3	35.4	31.2	56.0	46.0	-20.6	-14.8
2.490	25.1	22.9	10.6	0.3	36.0	33.8	56.0	46.0	-20.0	-12.2
7.670	31.9	22.3	11.2	0.1	43.2	33.6	60.0	50.0	-16.8	-16.4
13.560	32.8	31.8	11.4	0.4	44.6	43.6	60.0	50.0	-15.4	-6.4
27.120	32.7	29.1	12.2	1.3	46.2	42.6	60.0	50.0	-13.8	-7.4

4.3 Frequency Stability: FCC Part §2.1055, §15.225

Frequency as a function of temperature and voltage variation shall be maintained within the FCC-prescribed tolerances. Per §15.225(e) the frequency tolerance shall be maintained within ±0.01% of the reference frequency.

4.3.1 Test Procedure

The temperature stability was measured with the unit in an environmental chamber used to vary the temperature of the sample. The sample was held at each temperature step to allow the temperature of the sample to stabilize.

The frequency stability of the transmitter was examined at the voltage extremes and for the temperature range of -30°C to +50°C. The carrier frequency was measured while the EUT was in the temperature chamber. The reference frequency of the EUT was measured at the ambient room temperature with the frequency counter.

The frequency stabilities can be maintained to a lesser temperature range provided that the transmitter is automatically inhibited from operating outside the lesser temperature range.

The RF carrier frequency shall not depart from the reference frequency (reference frequency is the frequency at 20ºC and rated supply voltage) in excess of +/-1356 Hz.

The EUT is powered by 5Vdc voltage supplied via an external adjustable AC/DC power supply.

4.3.2 Test Results

The EUT complies with the temperature stability requirements of the specified standards. Test results are given in Table 9.

Table 9: Frequency Stability Test Data

Limit: 0.01%

Temperature Variations

Temperature (Centigrade)	Frequency (MHz)	Deviation (Hz)	Limit (+/- Hz)	Pass/Fail
23 (ambient)	13.560526	0	1356	NA
-30	13.560358	-168	1356	PASS
-20	13.560467	-59	1356	PASS
-10	13.560508	-18	1356	PASS
0	13.560542	16	1356	PASS
10	13.560550	24	1356	PASS
20	13.560542	16	1356	PASS
30	13.560533	7	1356	PASS
40	13.560517	-9	1356	PASS
50	13.560517	-9	1356	PASS

Voltage Variations

Nominal Voltage	Voltage (Volts)	Frequency (MHz)	Deviation (Hz)	Limit (+/- Hz)	Pass/Fail
120	Nominal Voltage	13.560517	0	1356	NA
138	115% of Nominal Voltage	13.560525	8	1356	PASS
102	85% of Nominal Voltage	13.560527	10	1356	PASS