EMC Testing Laboratories, Inc.

Test Report
To Determine Compliance With:
FCC, Part 15.249

Model number: 1301-01008, FCC ID: UIVFZBL01

Date: October 10, 2013

Manufacturer: New Potato Technologies
5508 Business Dr
Wilmington, NC, 28405

Contents Section

Section 1

GENERAL INFORMATION

Manufacturer:	New Potato Technologies 5508 Business Dr Wilmington, NC, 28405
Manufacturer representative:	**Mr. Daniel Pesavento**
Equipment covered by this report:	Model no. 1301-01008
Equipment serial no.	Prototype
Test specifications:	FCC, 15.215, 15.249
Product ratings:	3.0Vdc
Test report number:	13-196
Test commenced:	October 9, 2013
Test completed:	October 10, 2013
Test engineer:	**Edward Barnes**

Test Facility: The test facility used to perform these tests is on file with the FCC under registration number 637500 and IC no. 3519A and located at:

EMC Testing Laboratories, Inc.
2100 Brandon Trail
Suite 101
Alpharetta, GA 30004
770-475-8819

Section 2

PRODUCT DESCRIPTION and TESTS SUMMARY

Product Description:
Classic Match Foosball for iPad with Bluetooth Smart turns the Apple iPad into a Foosball Table. The table cradles the iPad, which becomes the Foosball field. 8 rods extend from the table, 4 on each side that actively control the virtual rods and Foos avatars shown on the iPad. Inside the table, 8 mouse sensors are used to track the motion of the rods. A Bluetooth smart (also known as Bluetooth 4.0 or Bluetooth Low Energy or BLE) radio connects to the iPad to provide a data connection to stream the rod positions to the iPad app. The unit is powered by 2 AAA disposable batteries and has no connectors.

Operating Temperature Range: 0°C to 50°C

Frequency range: 2402, 2440 and 2480 MHz

Transmit Power: 97.06 dBµV/m

Number of Channels: 3 Channels

Antenna Type: Bluetooth, PCB Trace antenna

Critical Components:

Printed wiring boards – The following printed wiring boards are utilized:

Name	Part. no.
Main board	1301-01008-100, Rev: 2.0

Test Operation:
For all measurements, the equipment under test was and caused to function in a continuous mode of operation for maximum electrical activity as specified by the manufacturer. Specifically, the product was caused to continuously transmit at the indicated frequencies.

Test Configuration:
The equipment under test (EUT) was set-up and configured as specified by the manufacturer as follows:

1- The EUT was connected to the following support peripherals:

A- None.

2- The EUT utilized the following cables.

A- None.

Modifications:
The following modifications were required to comply with the requirements.

1- None.

Tests Summary:

Table 1

Clause	**Test**	**Result**
15.249 (a)	Output power	Pass
15.215	20 dB Bandwidth	Pass
15.249(d)(e)	Radiated Emission Test	Pass
15.249(a)	Harmonic Emissions	Pass

The test results apply only to the products identified in this test report.

Engineering Statement:
All measurement data of this test report was taken in accordance with the FCC, parts 15.215, 15.249, ANSI C63.4 (09) by EMC Testing Laboratories, Inc. located in Alpharetta, Georgia. Although this data is taken under stringent laboratory conditions and to the best of our knowledge represents accurate data, it must be recognized that emissions from or immunity to this type equipment may be greatly affected by the final installation of the equipment. Therefore, EMC Testing Laboratories, Inc., while supporting the accuracy of the data in this report, takes no responsibility for use of equipment based on these tests. The manufacturer of this equipment must take full responsibility for any field problems which may arise, and agrees that EMC Testing Laboratories, Inc., in performing its functions in accordance with its objectives and purposes, does not assume or undertake to discharge any responsibility of the manufacturer to any other party or parties.

Conclusion:
With the above-indicated modifications, the product covered by this report has been tested and found to comply with the requirements of the above-indicated standards.

Tested by: **Edward Barnes, RF** Edward Barnes

Approved by: Gene Bailey
Gene Bailey, Engineering Manager
EMC Testing Laboratories, Inc.

Section 3

Test Report

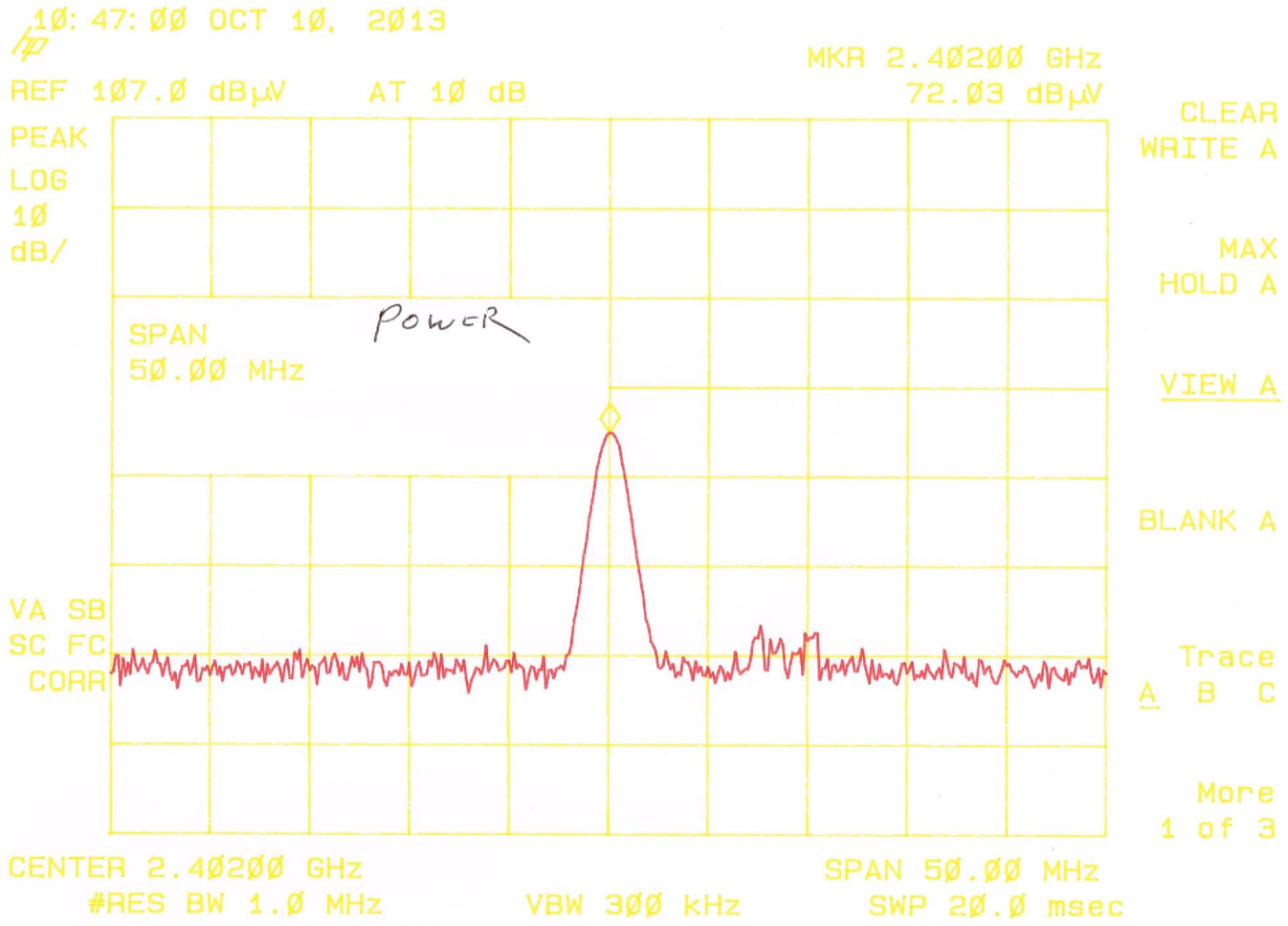
Subclause 15.249 (a) – Peak Output Power **Pass**

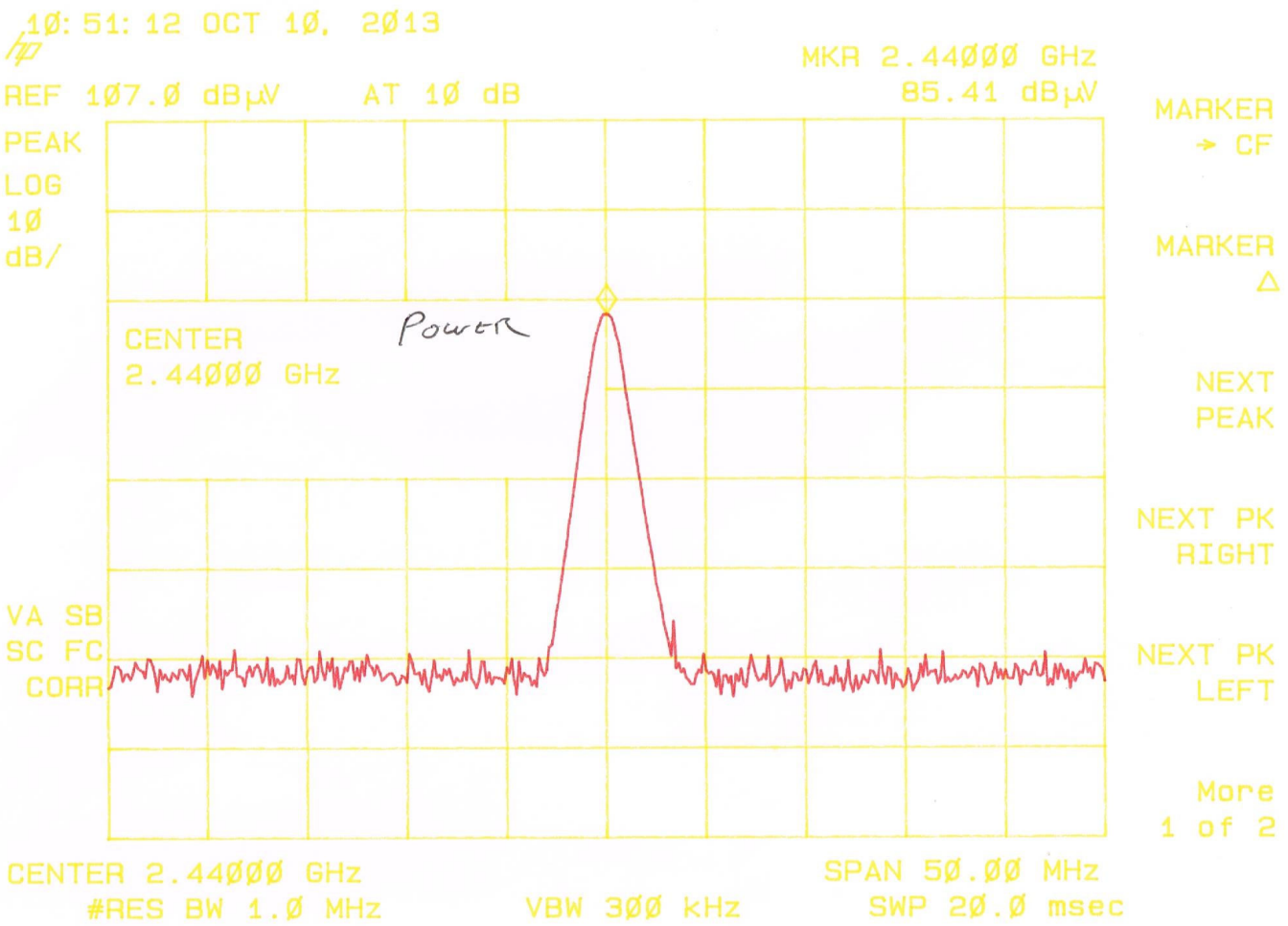
Test Specification: FCC Part 15.249
Mode of operation: Tx mode (2402MHz, 2440MHz, 2480MHz)
Port of testing: Radiated
Detector: Peak
RBW/VBW: 1MHz / 1MHz
Supply voltage: 3.0VDC from AA batteries
Temperature: 22ºC
Humidity: 57%

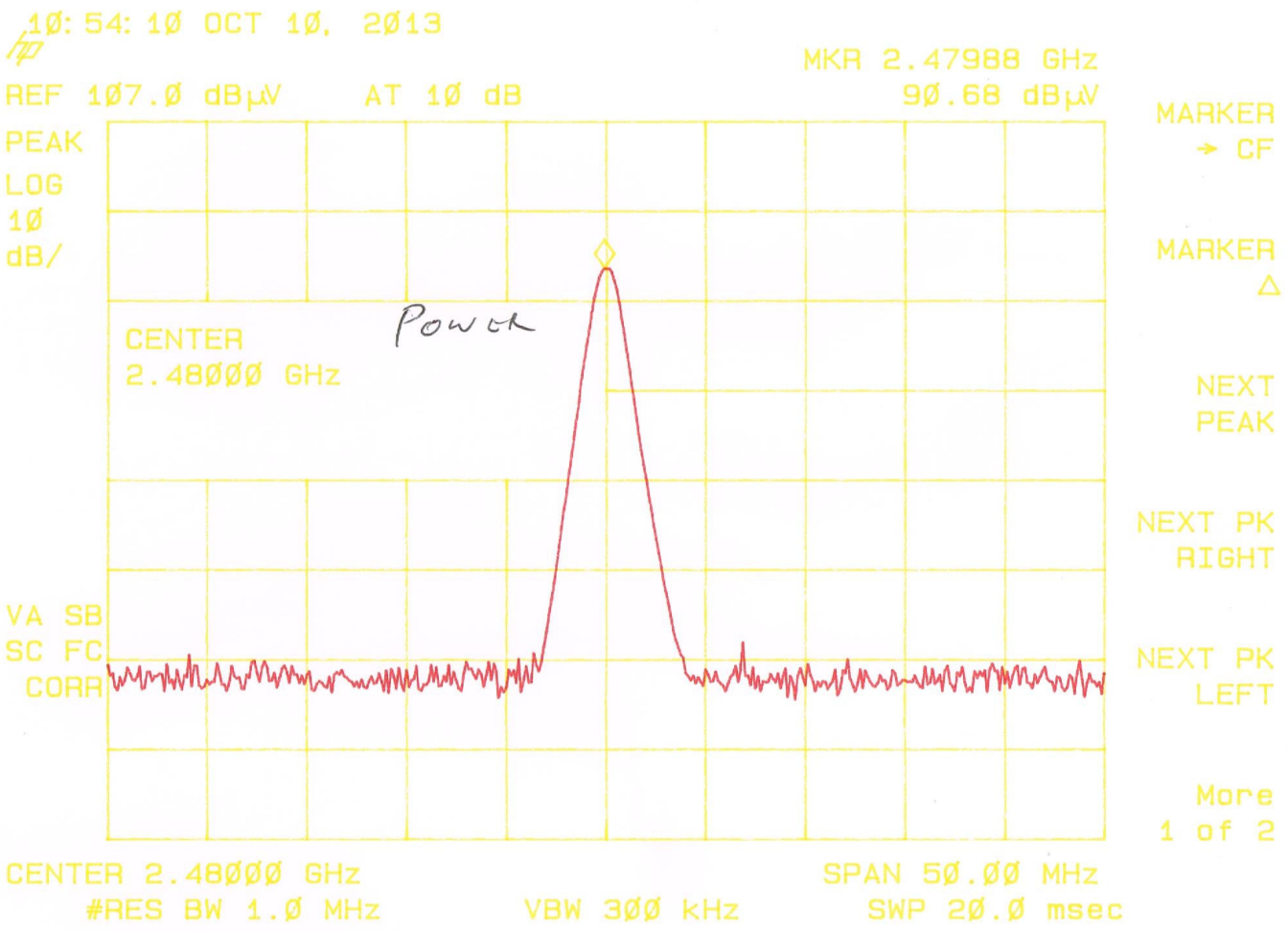
Results: See plots the next three pages.

Frequency (MHz)	**Measurement Reading output power (dBµV/m)**	**Corrected Output power (dBµV/m)**	**Limit (dBµV/m)**	**Minimum Margin dBµV/m**
2402	72.03	75.24	114	-38.76
2440	85.41	88.59	114	-25.41
2480	90.68	97.06	114	-16.94

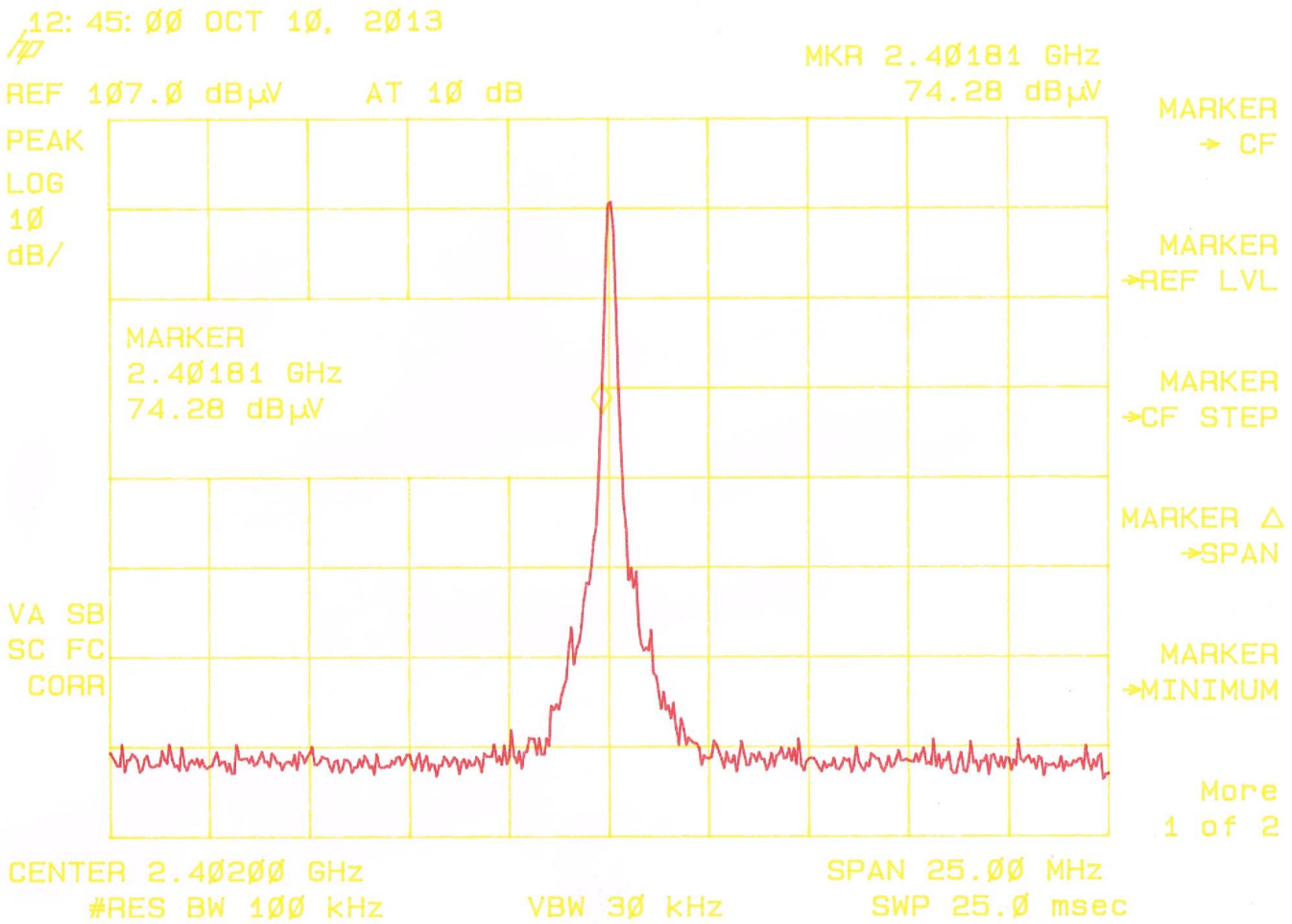
The measuring distance was 1 meter and the limit was increased 10 dBµV/m in Accordance with 15.31 (f) (1). Since the peak value is below the average limit, no Average measurements were required.

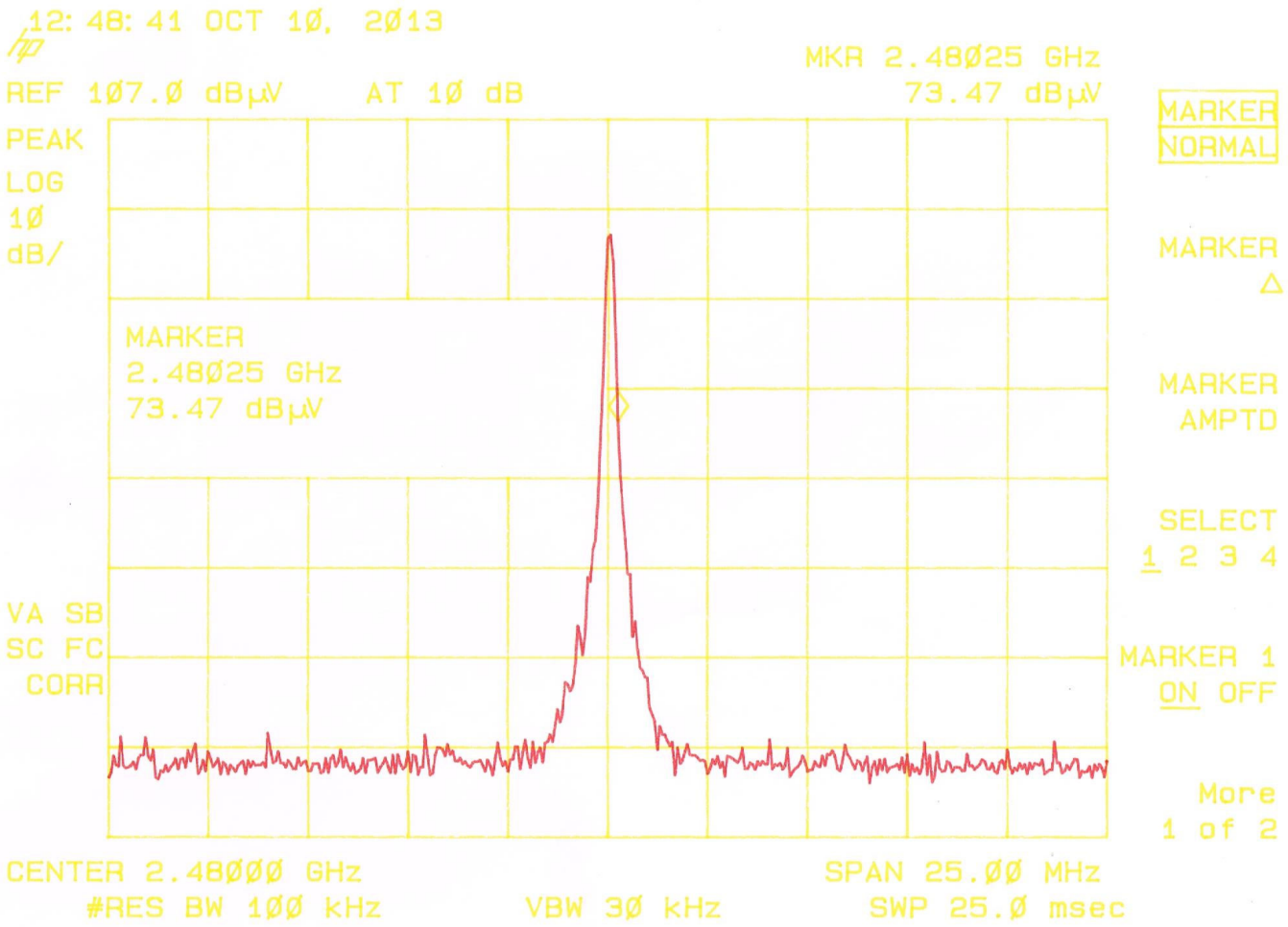

10: 47: 00 OCT 10, 2013
MKR 2.4020Ø GHz
REF 107.Ø dBµV
AT 10 dB
72.03 dBµV
CLEAR
WRITE A
PEAK
LOG
10
dB/
MAX
HOLD A
Power
SPAN
50.ØØ MHz
VIEW A
BLANK A
VA SB
SC FC
CORR
Trace
A B C
More
1 of 3
CENTER 2.4020Ø GHz
SPAN 50.ØØ MHz
#RES BW 1.Ø MHz
VBW 3ØØ kHz
SWP 20.Ø msec


10: 51: 12 OCT 10, 2013
MKR 2.44000 GHz
REF 107.0 dBµV
AT 10 dB
85.41 dBµV
PEAK
LOG
10
dB/
MARKER
→ CF
MARKER
Δ
CENTER
2.44000 GHz
Power
NEXT
PEAK
NEXT PK
RIGHT
VA SB
SC FC
CORR
NEXT PK
LEFT
More
1 of 2
CENTER 2.44000 GHz
#RES BW 1.0 MHz
VBW 300 kHz
SPAN 50.00 MHz
SWP 20.0 msec


10: 54: 10 OCT 10, 2013
MKR 2.47988 GHz
REF 107.0 dBµV
AT 10 dB
90.68 dBµV
PEAK
LOG
10
dB/
Power
CENTER
2.480000 GHz
VA SB
SC FC
CORR
MARKER
→ CF
MARKER
Δ
NEXT
PEAK
NEXT PK
RIGHT
NEXT PK
LEFT
More
1 of 2
CENTER 2.480000 GHz
#RES BW 1.0 MHz
VBW 300 kHz
SPAN 50.00 MHz
SWP 20.0 msec

Subclause 15.215 (c) - 20dB Bandwidth	**Pass**
Test Specification: FCC Part 15.215(c) **Mode of operation:** Tx mode **Port of testing:** Radiated **Detector:** Peak **RBW/VBW:** 1 MHz / 1 MHz **Supply voltage:** 3.0VDC from AA batteries **Temperature:** 22ºC **Humidity:** 57%	
Results: See plots the next page.	
Frequency, MHz	**20dB Bandwidth, dBµV/m**
2401	74.28
2480	73.47


12: 45: ØØ OCT 1Ø, 2Ø13
MKR 2.4Ø181 GHz
74.28 dBµV
REF 1Ø7.Ø dBµV
AT 1Ø dB
PEAK
LOG
1Ø
dB/
MARKER
2.4Ø181 GHz
74.28 dBµV
VA SB
SC FC
CORR
MARKER
→ CF
MARKER
→REF LVL
MARKER
→CF STEP
MARKER Δ
→SPAN
MARKER
→MINIMUM
More
1 of 2
CENTER 2.4Ø2ØØ GHz
#RES BW 1ØØ kHz
VBW 3Ø kHz
SPAN 25.ØØ MHz
SWP 25.Ø msec


12: 48: 41 OCT 1Ø, 2Ø13
MKR 2.48Ø25 GHz
REF 1Ø7.Ø dBµV
AT 1Ø dB
73.47 dBµV
PEAK
LOG
1Ø
dB/
MARKER
NORMAL
MARKER
Δ
MARKER
2.48Ø25 GHz
73.47 dBµV
MARKER
AMPTD
SELECT
1 2 3 4
VA SB
SC FC
CORR
MARKER 1
ON OFF
More
1 of 2
CENTER 2.48ØØØ GHz
#RES BW 1ØØ kHz
VBW 3Ø kHz
SPAN 25.ØØ MHz
SWP 25.Ø msec

Radiated Emissions

INTRODUCTION:

The product covered by this report was subjected to electromagnetic interference emissions measurements to determine compliance with the FCC, Parts 15.249 requirements.

Radiated and conducted emissions were measured in accordance with the Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 KHz to 40 GHz, ANSI C63.4.

During this test, a radio was connected to the EUT.

MEASUREMENT CALCULATIONS:

Radiated Emissions:

For radiated emissions measurements, the signal attenuation due to impedance losses in the antenna and signal cable were significant and was added to the spectrum analyzer reading to give corrected signal strength reading. If a preamplifier was used, the signal gain was subtracted from the signal strength reading. Radiated emissions data was specified as decibels above 1 microvolt per meter (dBμV/m) of radiated field strength.

Radiated emissions (dBμV) = Analyzer reading (dBμV) plus
antenna factor (dB) plus cable factor (dB) minus Amplifier gain (dB)

Conducted Emissions:

For conducted emissions, the signal attenuation due to impedance losses in the LISN and signal cables was negligible and assumed to be 0dB. The conducted emissions were directly equal to the spectrum analyzer reading. Conducted emissions data was specified as decibels above 1 microvolt (dBμV) of conducted line voltage.

Conducted emissions (dBμV) = Analyzer reading (dBμV)

RADIATED EMISSIONS MEASUREMENT:

Radiated emissions measurements were performed at an open field test site. The receiving antenna was positioned 1 meter from the equipment under test along the center axis of the test site. Measurements were made with broadband antennas and if necessary, detected emissions were verified with dipole antennas. The dipole antenna was manually tuned to the signal frequency by adjusting the length of the antenna elements.

The radiated emissions were measured for both the horizontal and vertical signal planes by rotating the antennas. Additionally, the EUT was rotated by the turntable and the antenna height was raised and lowered 1 to 4 meters to locate the maximum emission strength at each frequency.

The radiated emissions were measured over the frequency span of 30 MHz to 1000 MHz. The following antennas were used to measure the radiated emissions within the specified frequency spans.

CONDUCTED EMISSIONS MEASUREMENT:

Conducted emissions measurements were performed on a ground plane that was electrically bonded to earth ground. The equipment under test was positioned 0.8 meter above the ground plane and 0.8 meter minimum from the LISN that was positioned on the ground plane. The LISN housings were electrically bonded to the ground plane. The conducted emissions for both the ungrounded supply conductor (L1) and the grounded conductor (L2) of the power supply cord were measured. The conducted emissions were measured over the frequency span of 0.15 to 30 MHz. The measurements were conducted in the quasi-peak and average detector modes.

INSTRUMENTATION:

Radiated and conducted signal strength measurements were taken with a spectrum analyzer. Radiated emissions were measured with broadband and tuned dipole antennas. Conducted emissions were measured with a 50 UH line impedance stabilization network (LISN).

DETECTOR FUNCTION:

Unless otherwise indicated in this report, all measurements were taken using a peak hold signal detector function. In this mode, the spectrum analyzer makes continuous scans across the frequency band and stores the highest emission value detected at each frequency for all scans. The peak hold integration will detect transient or low duty cycle emissions peak, which might be missed on single scan measurement. The emission value at each frequency was a true value.

SPECTRUM ANALYZER SETTING:

For all measurements, the spectrum analyzer was set for 10 dB input attenuation, 10 dB/Division vertical scale and 90 or 100 dBμV reference level. The resolution bandwidth was set at 9 KHz for the 0.15 - 30 MHz span and at 120 KHz for 30 - 1000 MHz span. The video bandwidth and sweep rate were automatically coupled by the analyzer.

Test Method cont…

Results

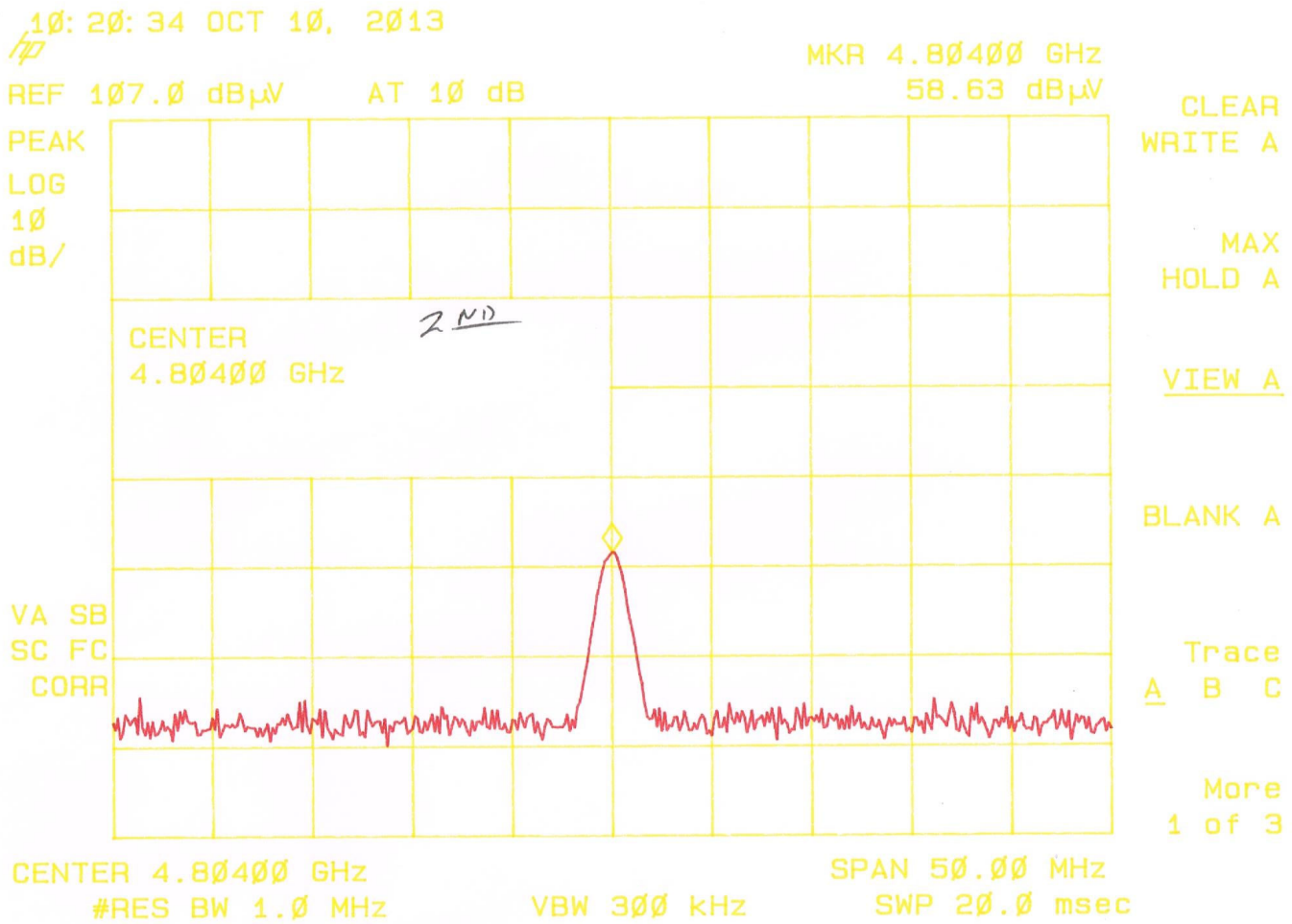
Frequency, MHz	Measurement Reading, dBμV/m	Corrected Reading, dBμV/m	EN55022 Limit, dBμV/m	Minimum Margin, dBμV/m
Horizontal and Vertical				
There were no measurable emissions from the EUT Within 12dB of the limits				

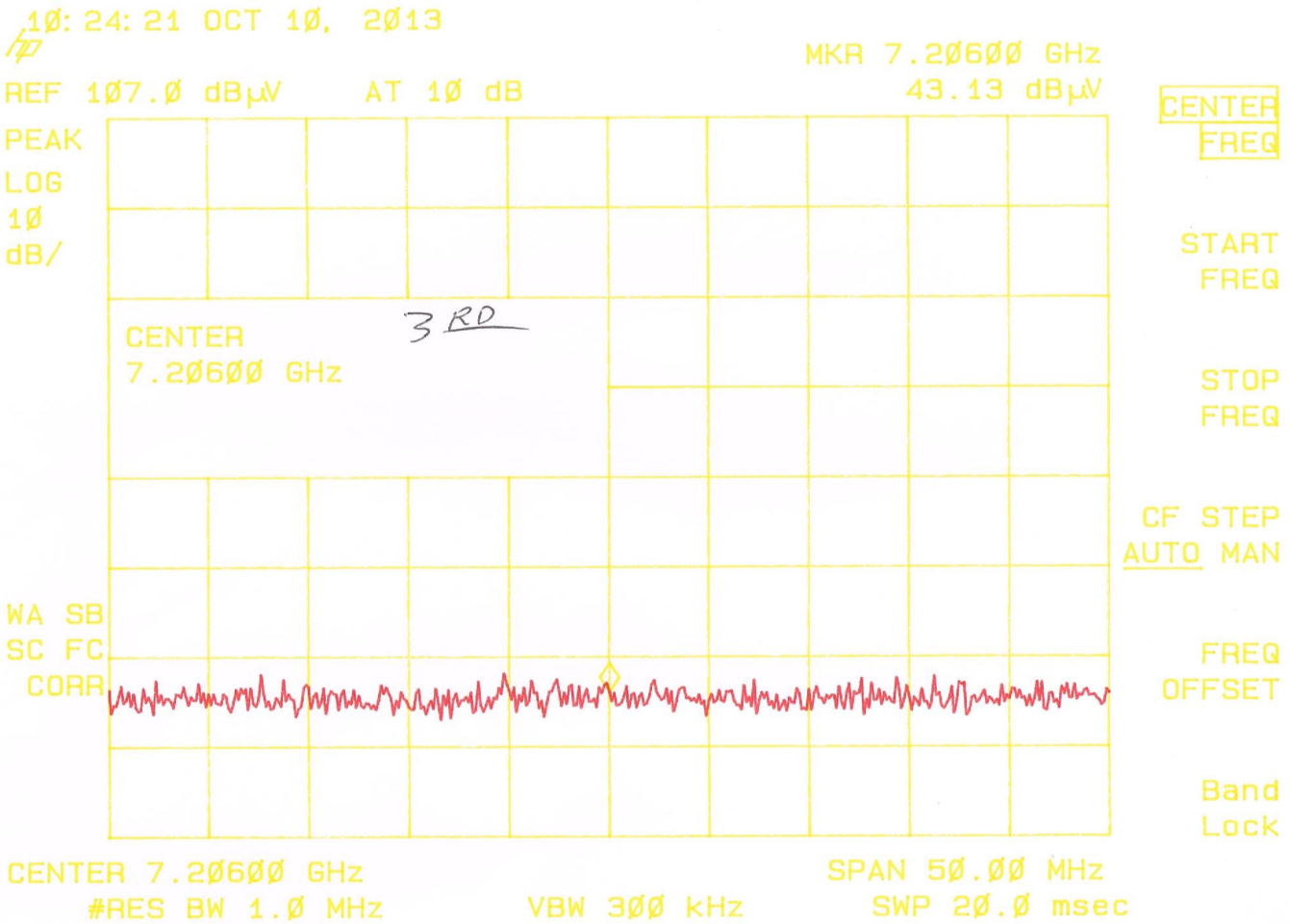
Harmonic Emissions

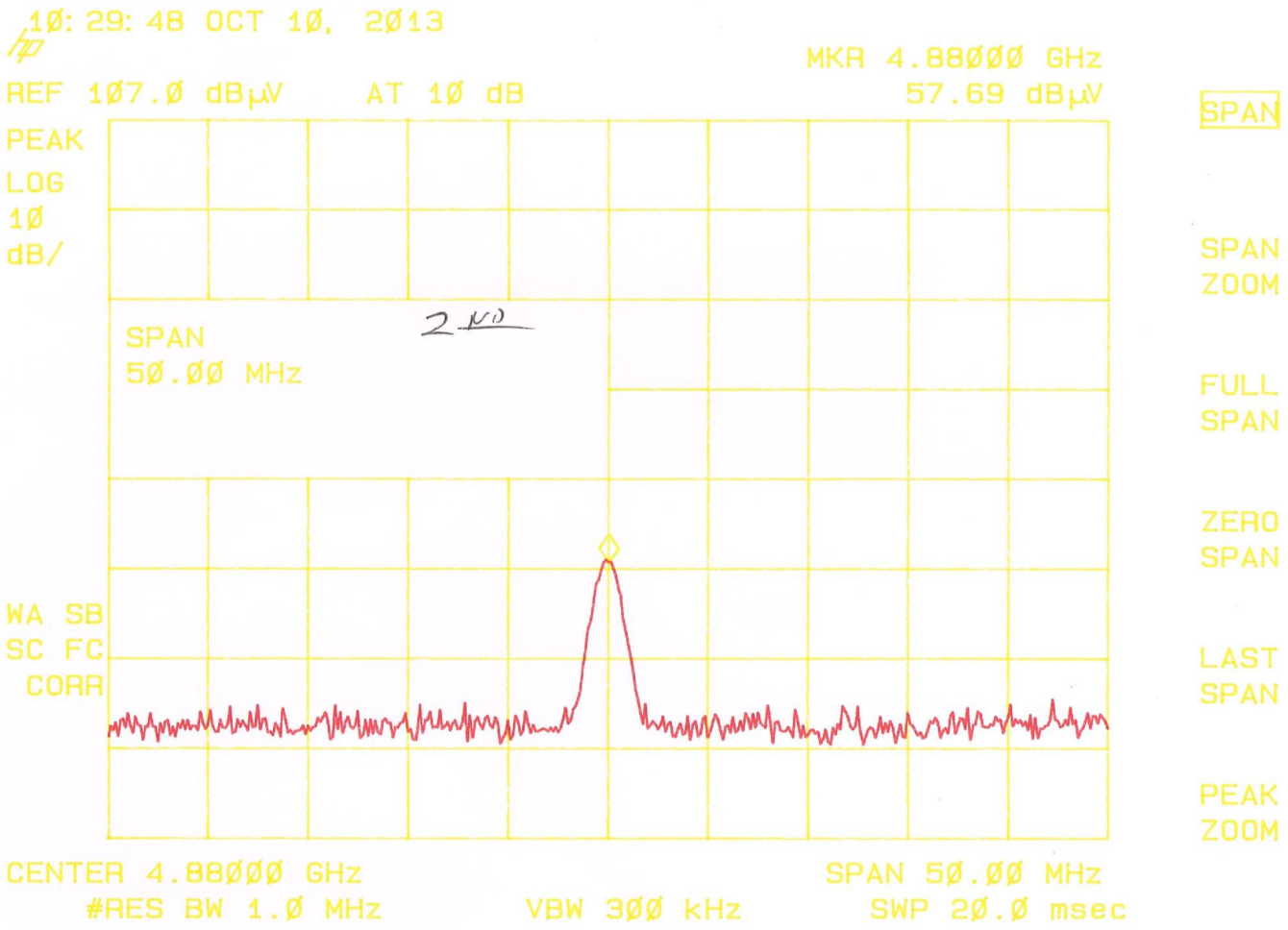
Frequency (MHz)	Measurement Reading output power (dBμV/m)	Corrected Output power (dBμV/m)	Limit at 1 meter distance (dBμV/m)	Minimum Margin dBμV/m
4804	58.63	61.27	64.0	-2.73
7206	43.13	46.24	64.0	-17.76
4880	57.69	60.52	64.0	-3.48
7320	43.59	46.28	64.0	-17.72
4960	56.95	60.17	64.0	-3.83
7440	43.33	46.51	64.0	-17.49

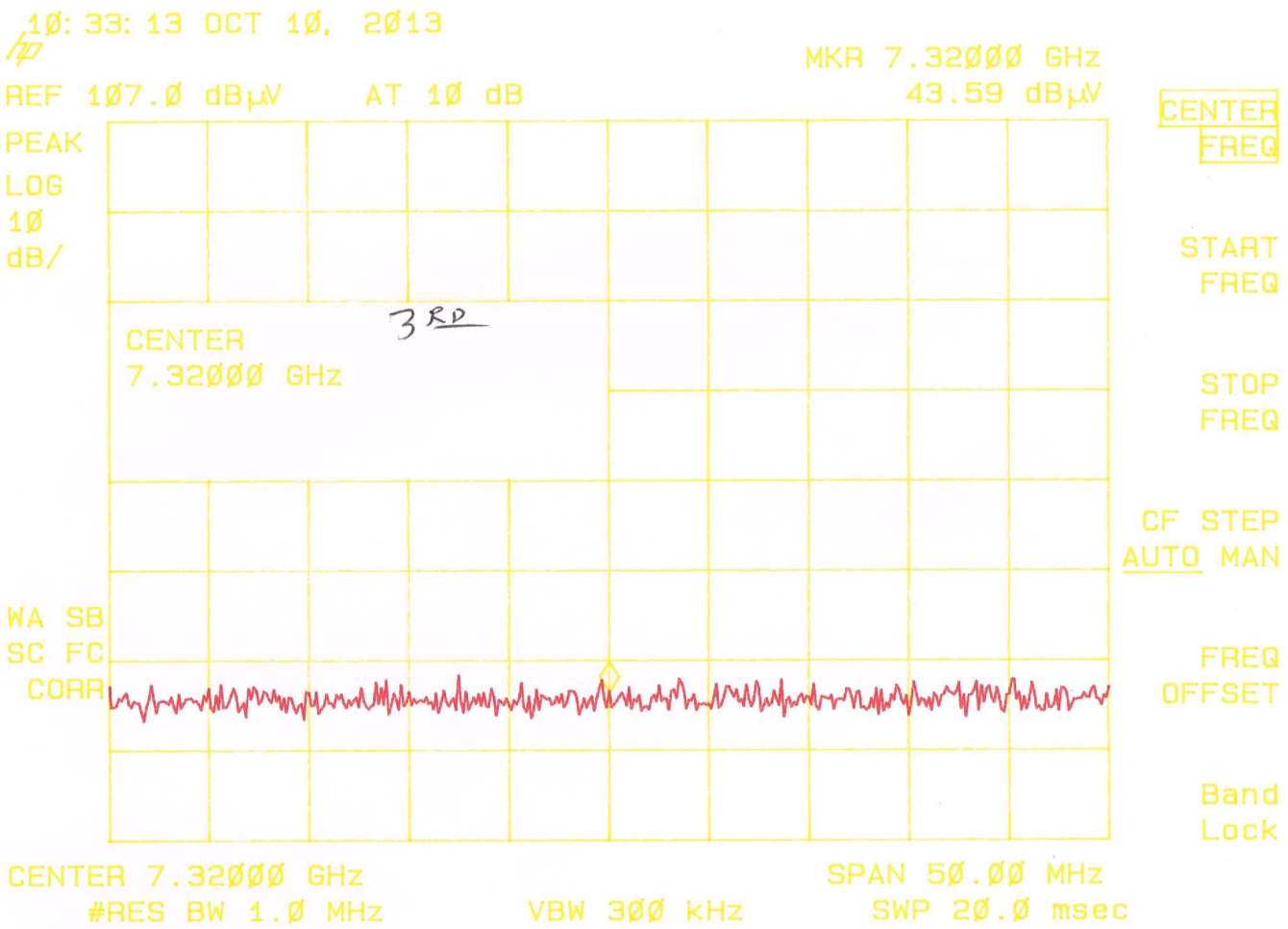
The unit was operated on all fundamental frequencies within the frequency band (2.402 GHz, 2.440 GHz and 2.480 GHz).

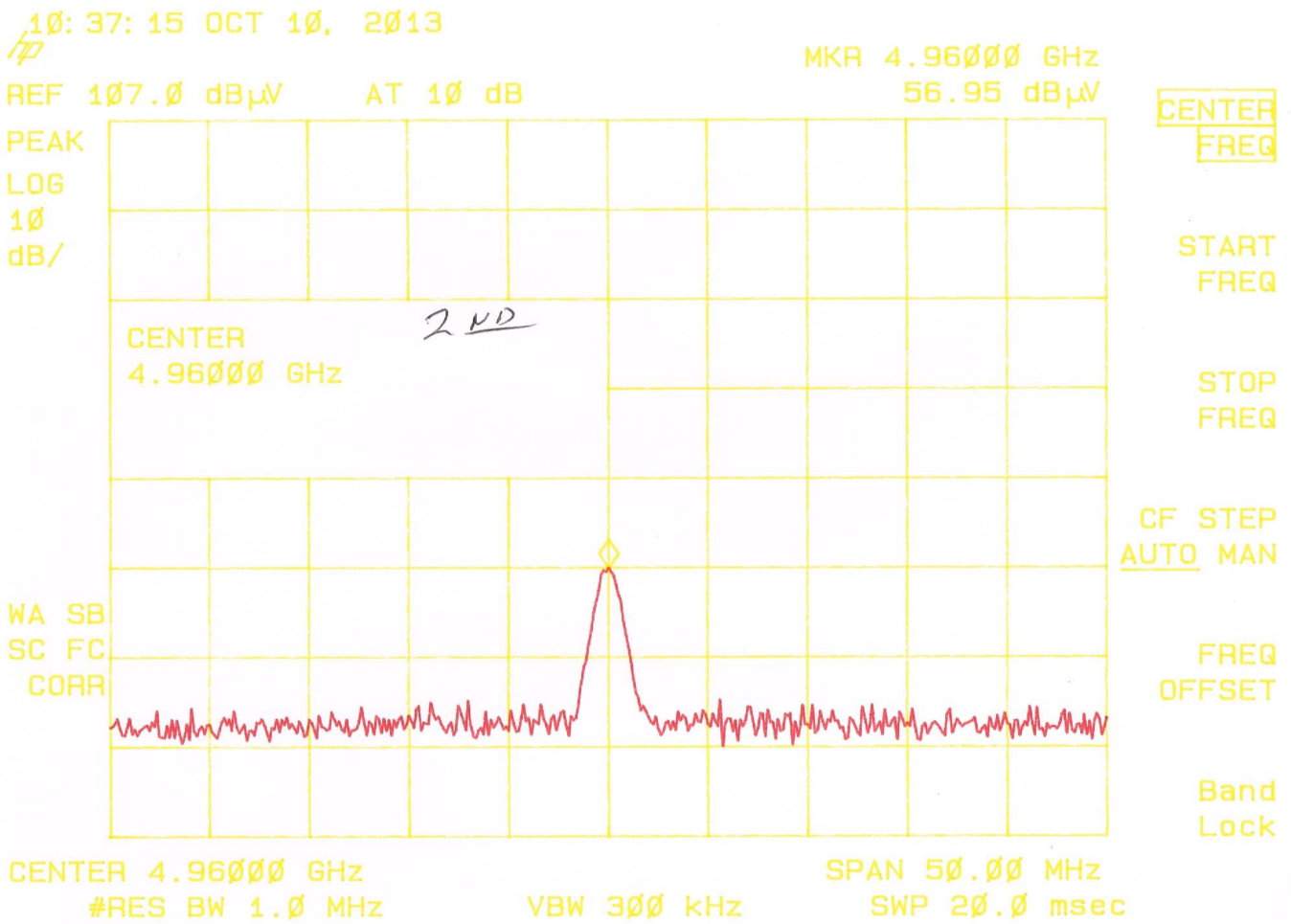
The following plots show the measured levels at the 2nd and 3rd harmonics of the fundamentals. The highest level of each harmonic was found and recorded in the table. No higher order harmonics were found. The unit was tested in both Horizontal and Vertical. Only the vertical are recorded or shown here as they were the highest measured.

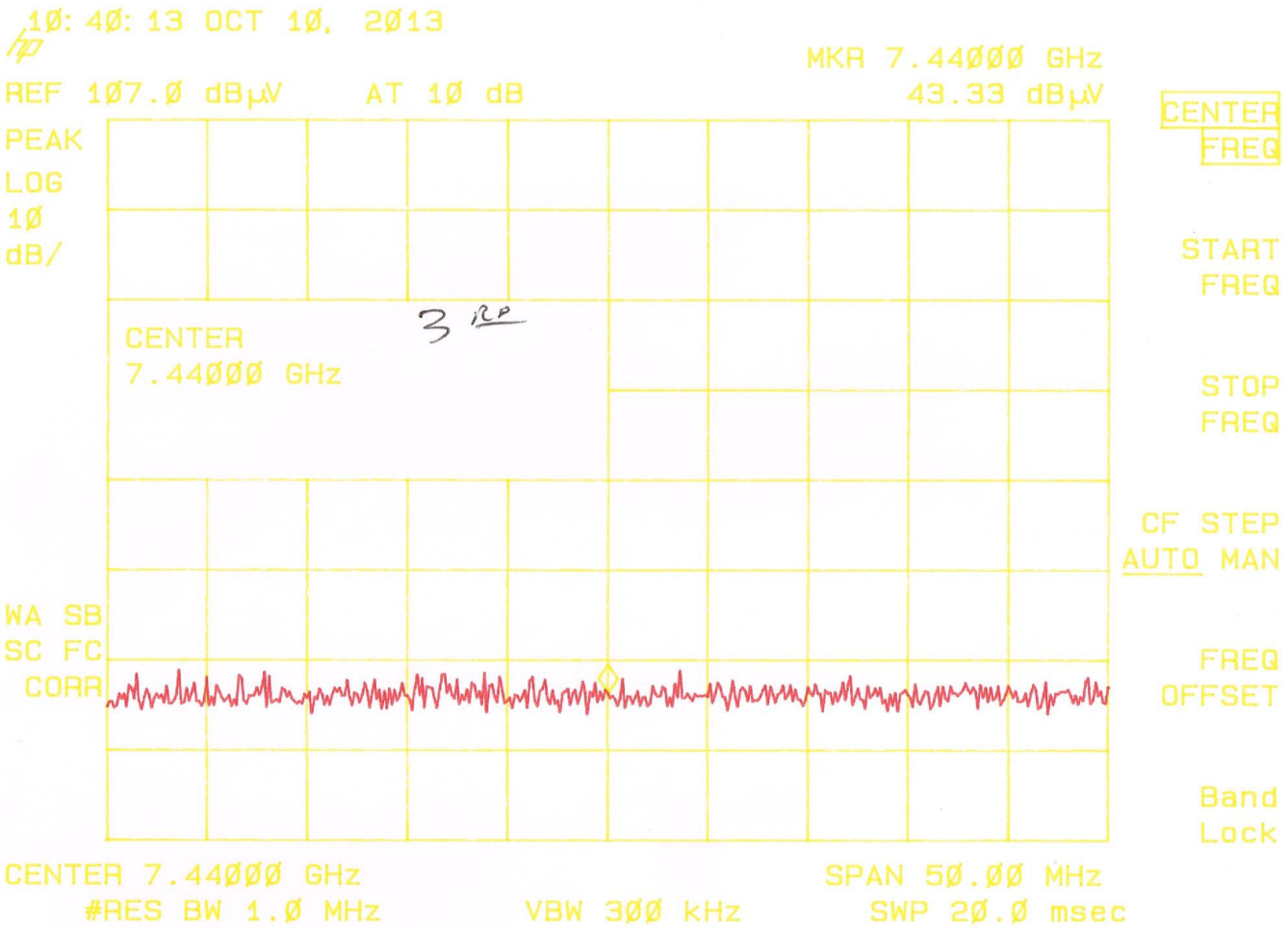

10: 20: 34 OCT 10, 2013
MKR 4.8040Ø GHz
58.63 dBµV
REF 107.Ø dBµV
AT 10 dB
CLEAR
WRITE A
PEAK
LOG
10
dB/
MAX
HOLD A
2ND
CENTER
4.8040Ø GHz
VIEW A
BLANK A
VA SB
SC FC
CORR
Trace
A B C
More
1 of 3
CENTER 4.8040Ø GHz
#RES BW 1.Ø MHz
VBW 30Ø kHz
SPAN 50.ØØ MHz
SWP 20.Ø msec


10: 24: 21 OCT 10, 2013
MKR 7.2060Ø GHz
REF 107.Ø dBµV
AT 10 dB
43.13 dBµV
CENTER FREQ
PEAK
LOG
10
dB/
START FREQ
3RD
CENTER
7.2060Ø GHz
STOP FREQ
CF STEP
AUTO MAN
WA SB
SC FC
CORR
FREQ OFFSET
Band Lock
CENTER 7.2060Ø GHz
SPAN 50.ØØ MHz
#RES BW 1.Ø MHz
VBW 3ØØ kHz
SWP 2Ø.Ø msec


10: 29: 48 OCT 10, 2013
MKR 4.88000 GHz
REF 107.0 dBµV
AT 10 dB
57.69 dBµV
SPAN
PEAK
LOG
10
dB/
SPAN ZOOM
2 MD
SPAN
50.00 MHz
FULL SPAN
ZERO SPAN
WA SB
SC FC
CORR
LAST SPAN
PEAK ZOOM
CENTER 4.88000 GHz
SPAN 50.00 MHz
#RES BW 1.0 MHz
VBW 300 kHz
SWP 20.0 msec


10: 33: 13 OCT 10, 2013
MKR 7.32000 GHz
REF 107.0 dBµV
AT 10 dB
43.59 dBµV
CENTER FREQ
PEAK
LOG
10
dB/
START FREQ
3RD
CENTER
7.32000 GHz
STOP FREQ
CF STEP
AUTO MAN
WA SB
SC FC
CORR
FREQ OFFSET
Band Lock
CENTER 7.32000 GHz
SPAN 50.00 MHz
#RES BW 1.0 MHz
VBW 300 kHz
SWP 20.0 msec


10: 37: 15 OCT 10, 2013
MKR 4.960000 GHz
REF 107.0 dBµV
AT 10 dB
56.95 dBµV
CENTER FREQ
PEAK
LOG
10
dB/
START FREQ
2ND
CENTER
4.960000 GHz
STOP FREQ
CF STEP
AUTO MAN
WA SB
SC FC
CORR
FREQ OFFSET
Band Lock
CENTER 4.960000 GHz
#RES BW 1.0 MHz
VBW 300 kHz
SPAN 50.00 MHz
SWP 20.0 msec


10: 40: 13 OCT 10, 2013
MKR 7.44000 GHz
REF 107.0 dBµV
AT 10 dB
43.33 dBµV
PEAK
LOG
10
dB/
CENTER
7.44000 GHz
3 RP
WA SB
SC FC
CORR
CENTER FREQ
START FREQ
STOP FREQ
CF STEP
AUTO MAN
FREQ OFFSET
Band Lock
CENTER 7.44000 GHz
#RES BW 1.0 MHz
VBW 300 kHz
SPAN 50.00 MHz
SWP 20.0 msec

Section 4

TEST EQUIPMENT

Test Equipment	Manufacturer	Model No.	Serial no.	Cal. Due Date
Spectrum Analyzer	HP	8591A	2919A00171	5/14
Spectrum Analyzer	HP	8592L	3649A00744	7/14
Signal Generator	HP	8648C	3847A0928	5/14
LISN	Emco	3825/2	9305-2088	5/14
Preamplifier	HP	8449B	3808A00914	5/14

Antennas	Manufacturer	Model No.	Serial no.	Cal. Due Date
Biconical	Electro-Metrics	BIA-25	2451	3/14
Log Periodic	Emco	3146	9306-3643	3/14
Biconilog	Emco	3142	9607-1053	3/14
Active Loop Antenna	Emco	6502	9809-4032	5/14
Horn	Emco	3115	9405-4264	5/14
Horn	Emco	3116	9505-2255	5/14

All test equipment are calibrated annually