

EMC Testing Laboratories, Inc.

Test Report To Determine Compliance With: FCC, Part 15.249 and RSS-210

Model number: 750-BR02

FCC ID: UIVBR101001

Date: October 8, 2015

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

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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. 750-BR02
Options covered by this report:	None
Equipment serial no.	Prototype
Test specifications:	FCC, 15.215, 15.249 and RSS-210
Product ratings:	3Vdc, Coin battery
Test report number:	15-123A
Test commenced:	October 6, 2015
Test completed:	October 8, 2015
Test engineer:	Gary Morrow
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:

Brio is a Smart Coaster that links with a smartphone to secure unattended beverages. Brio is placed over the user's beverage and then armed, after which point if the coaster is touched or moved, the alarm is triggered and the user is notified over the wireless connection to their smartphone. In addition to the security feature, the devices motion detection and light ring add the capability for a bevy of features and games.

Product utilizes a radio manufactured by Texas Instruments, model no. CC2640. FCC and European approved.

Operating Temperature Range: 0°C to 50°C

Frequency range: 2402 – 2480 MHz

Transmit Power: 99.19 dBμV/m

Modulation Technique: FHSS

Number of Channels: 40

Antenna Type: Bluetooth, PCB Trace antenna

Critical Components:

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

<u>Name</u>	<u>Part. no.</u>
Main Board	750-BR02-PCB-V1

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 communicate with an iPod and caused to transmit by a cable connected to a radio.

Product Description and Test Summary cont...

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- A 90.5 cm long shielded cable for connection to radio.

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.

Product Description and Test Summary cont...

Engineering Statement:

All measurement data of this test report was taken in accordance with the FCC, parts 15.215, 15.249, ANSI C63.4-2003 and IC, RSS-210 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: **Gary Morrow, Lab. Technician**

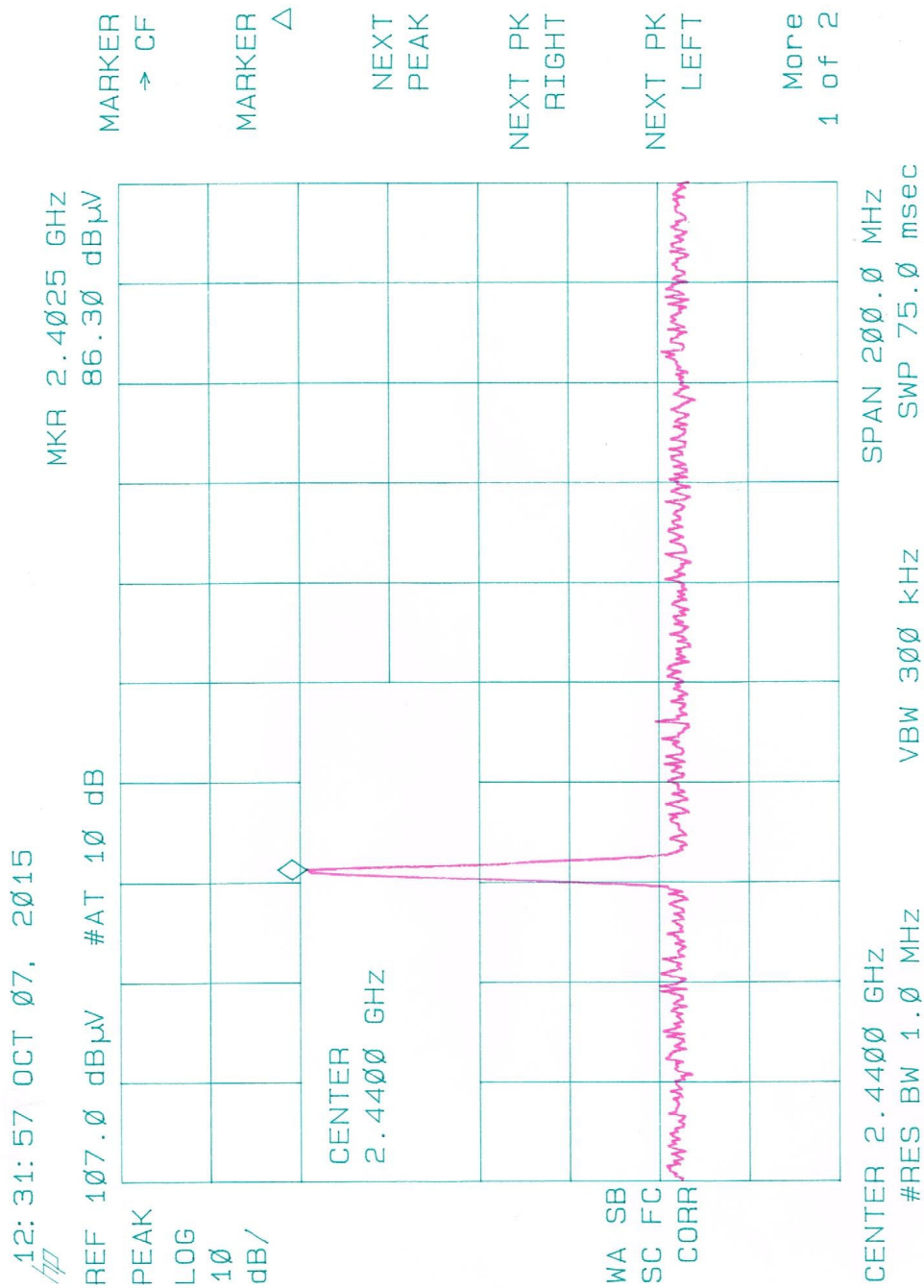
Approved by: _____
Gene Bailey, Engineering Manager,
EMC Testing Laboratories, Inc.

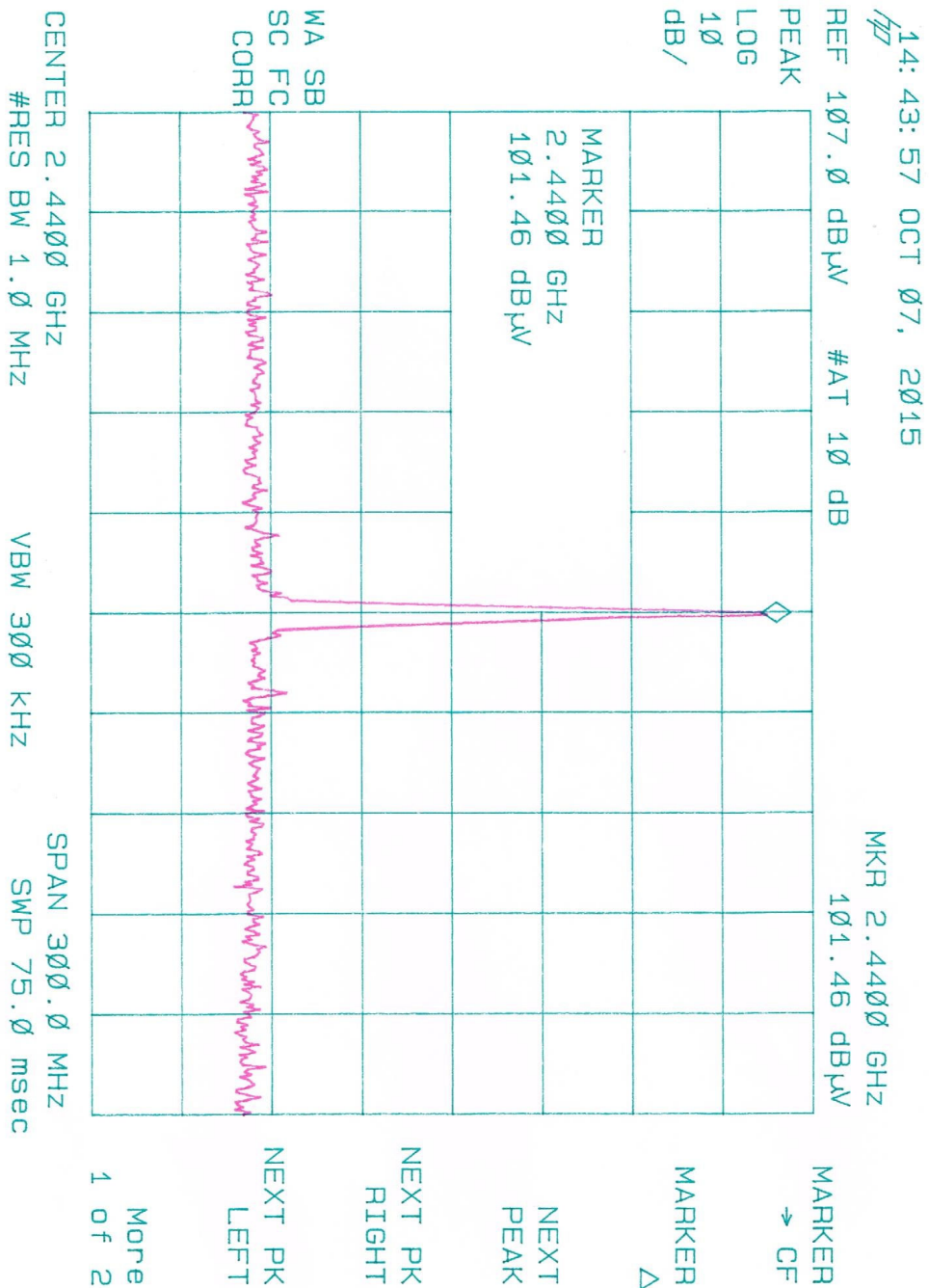
Section 3

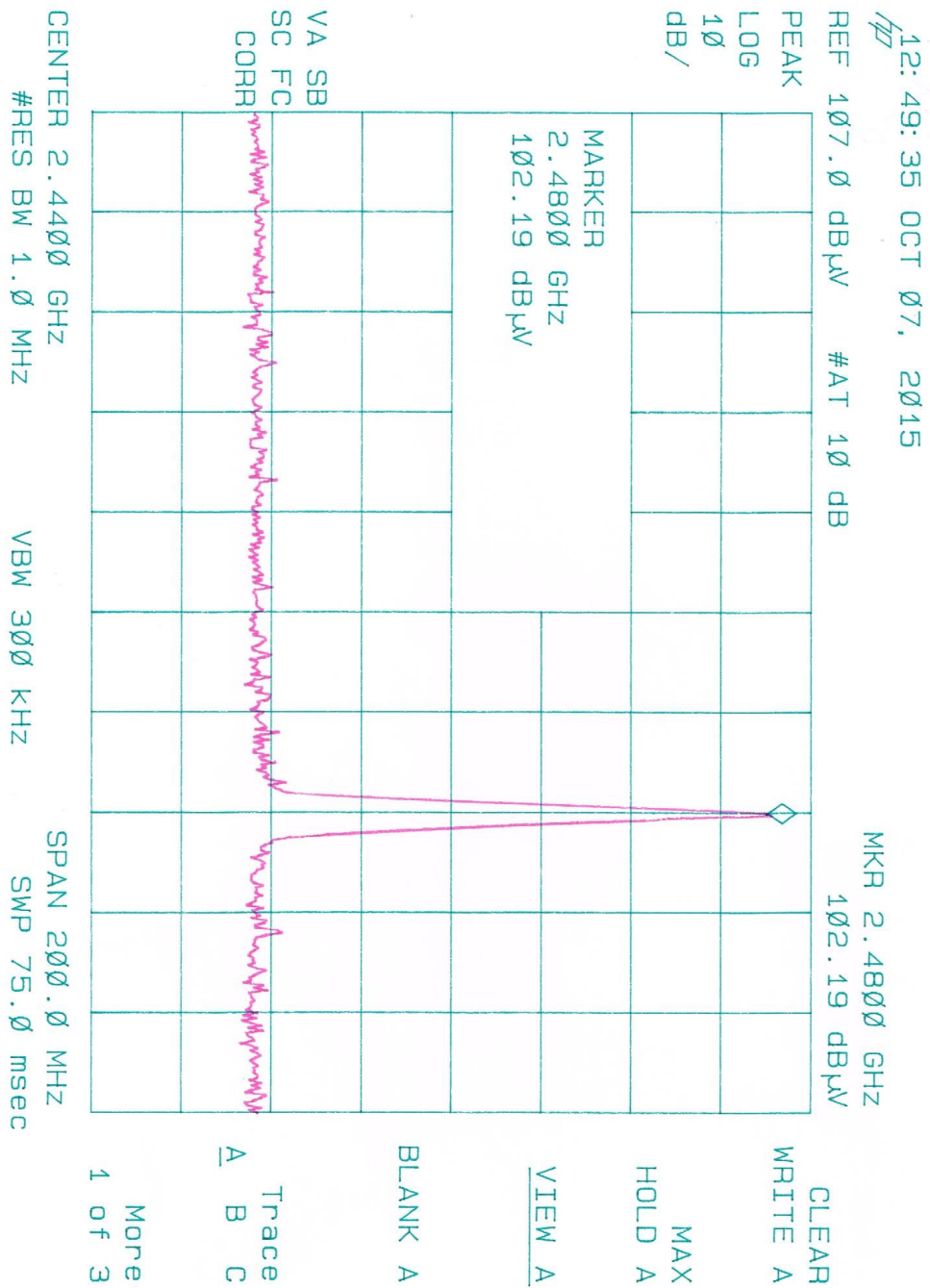
Test Report

Subclause 15.249 (a) – Peak Output Power Pass				
Test Specification: FCC Part 15.249 Mode of operation: Tx mode (2402MHz, 2440MHz, 2482MHz) Port of testing: Conducted Detector: Peak RBW/VBW: 1MHz / 1MHz Supply voltage: 3VDC from coin battery Temperature: 23°C Humidity: 50%				
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	86.30	83.30	104	-20.7
2440	101.46	98.46	104	-5.54
2480	102.19	99.19	104	-4.81

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.

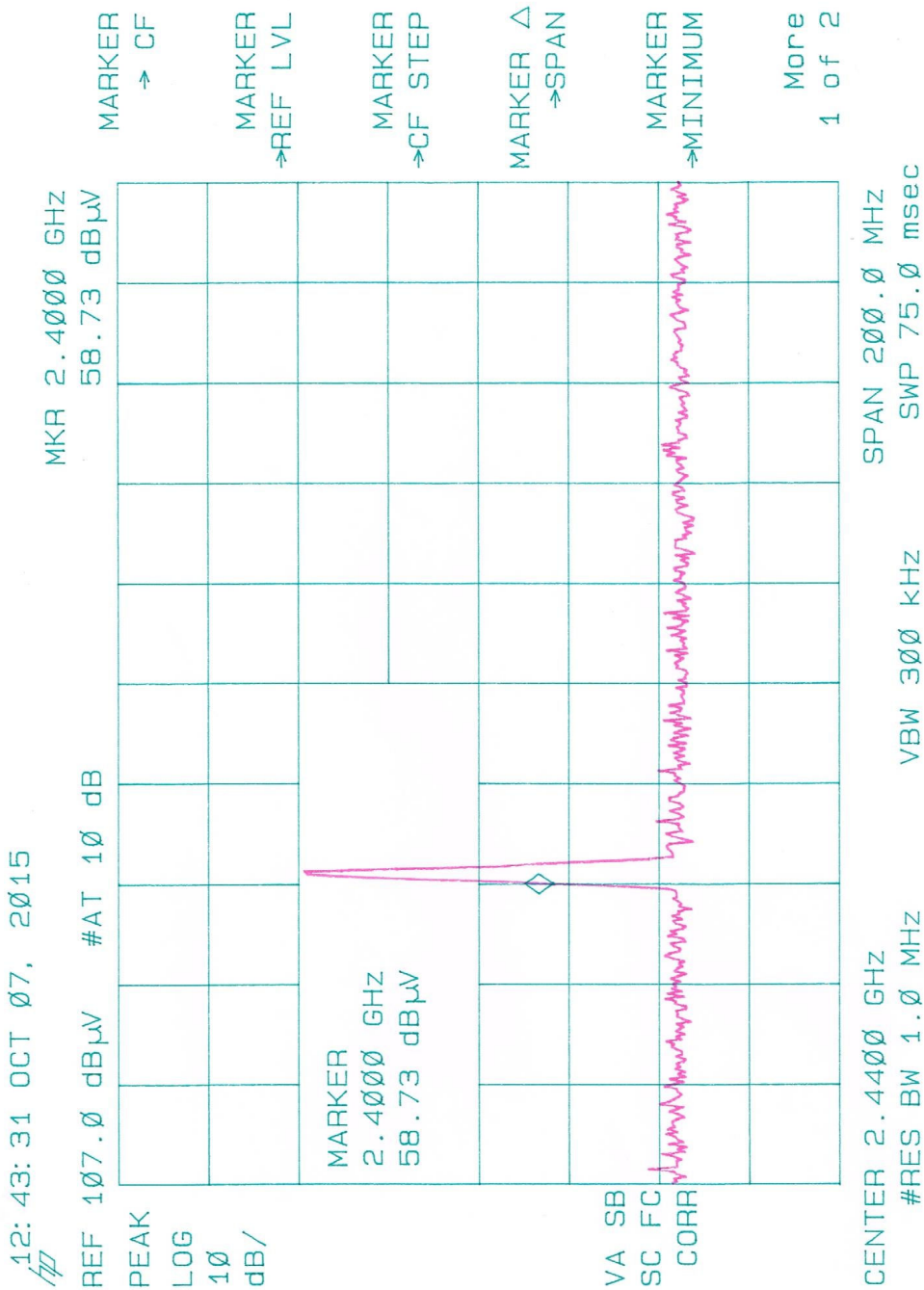


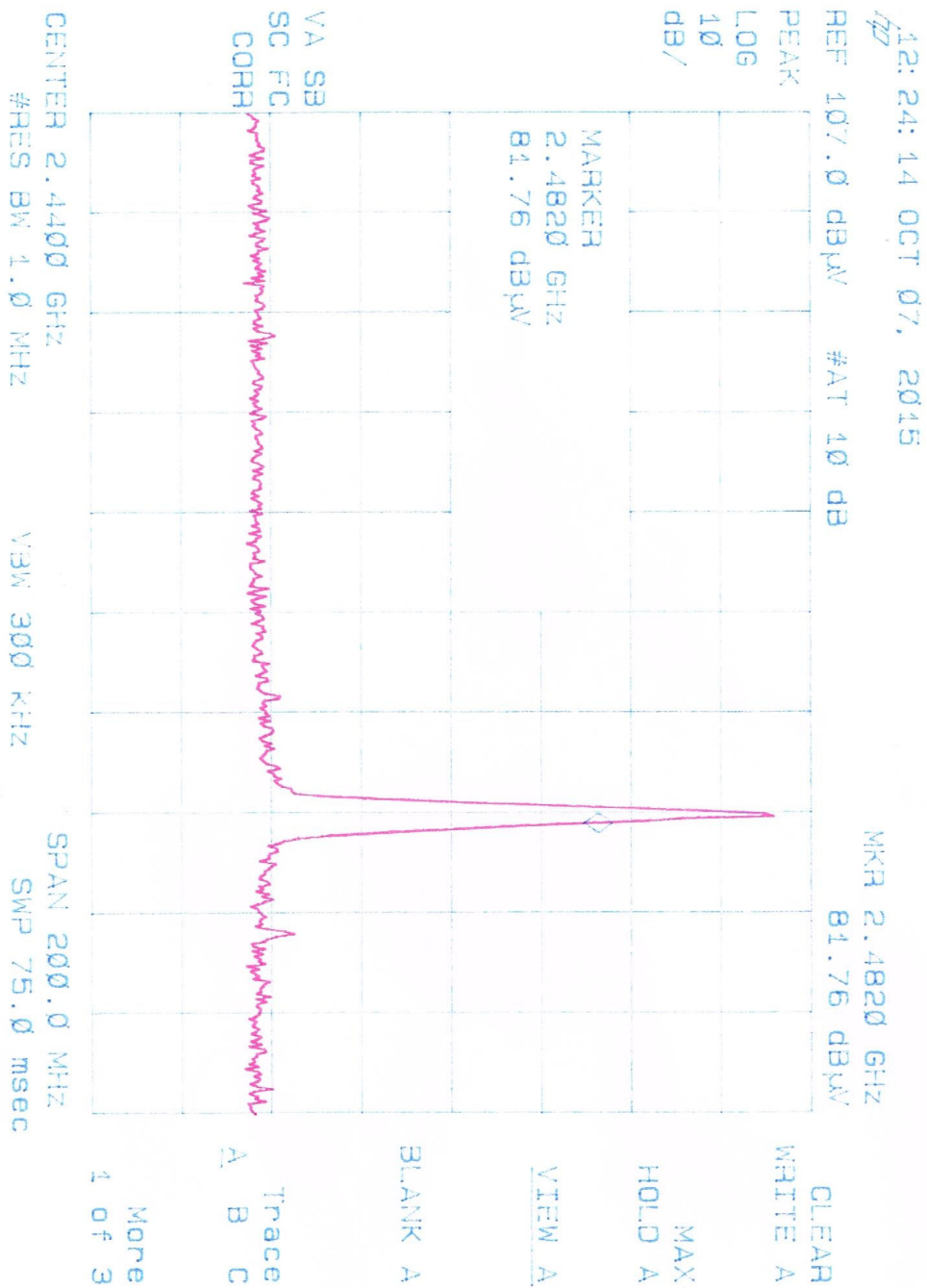




Test Report cont...

Subclause 15.215 (c) - 20dB Bandwidth		Pass
Test Specification: FCC Part 15.215(c) Mode of operation: Tx mode Port of testing: Conducted Detector: Peak RBW/VBW: 1 MHz / 1 MHz Supply voltage: 3VDC from coin battery Temperature: 23°C Humidity: 50%		
Results: See plots the next page.		
Frequency, MHz	20dB Bandwidth, dB μ V/m	
2400	58.73	
2482	81.76	





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.

$$\text{Radiated emissions (dB}\mu\text{V)} = \text{Analyzer reading (dB}\mu\text{V)} \text{ plus} \\ \text{antenna factor (dB) plus cable factor (dB) minus Amplifier gain (dB)}$$

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.

$$\text{Conducted emissions (dB}\mu\text{V)} = \text{Analyzer reading (dB}\mu\text{V)}$$

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.

Test Method cont...

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 dB μ V 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

See table below and following three plots for the harmonics.

Frequency, MHz	Measurement Reading, dB μ V/m	Corrected Reading, dB μ V/m	EN55022 Limit, dB μ V/m	Minimum Margin, dB μ V/m
Horizontal and Vertical				
There were no emissions within 12 dB from the limits				

Harmonic Emissions

Frequency (MHz)	Measurement Reading output power (dB μ V/m)	Corrected Output power (dB μ V/m)	Limit at 1 meter distance (dB μ V/m)	Minimum Margin dB μ V/m
4804	47.97	50.97	64.00	-13.03
4880	43.74	46.74	64.00	-17.26
4960	43.86	46.86	64.00	-17.14

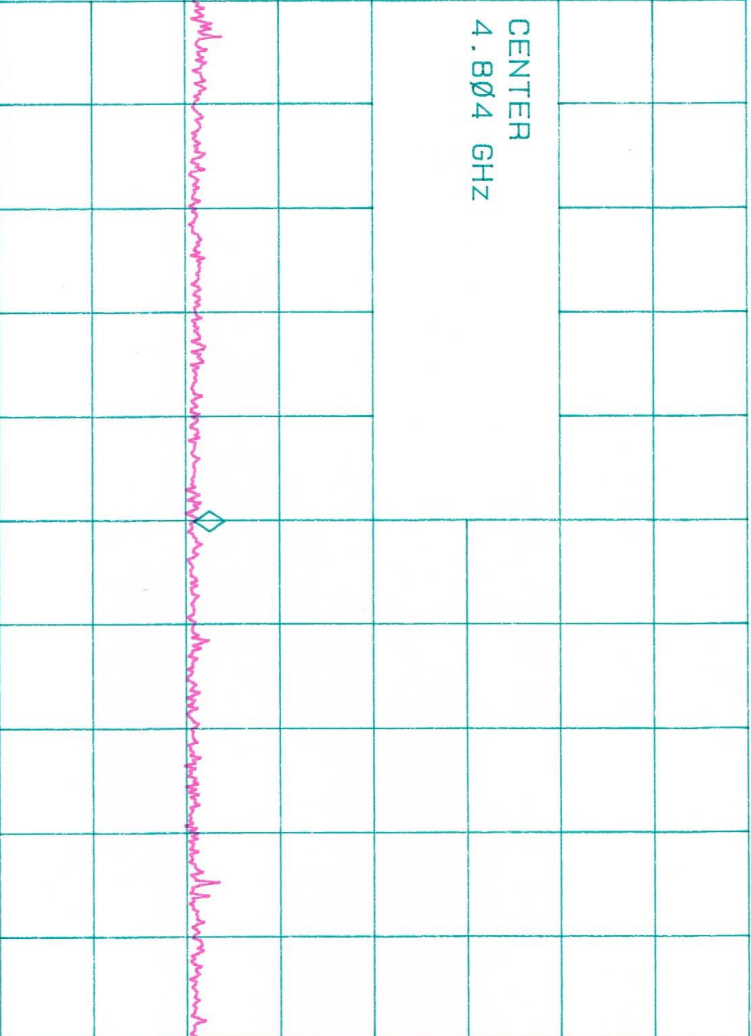
The unit was operated on all fundamental frequencies within the frequency band (2.402 GHz to 2.480 GHz). The following plots show the measured levels at the 2nd harmonics of the fundamental. The highest level of each harmonic was found and recorded in the table. No higher order harmonics were found. The unit was tested in both Horizontal and Vertical. Only the vertical are recorded or shown here as they were the highest measured.

12:20:18 OCT 08, 2015

REF 107.0 dBμV #AT 10 dB

MKR 4.804 GHz
47.97 dBμV

PEAK
LOG
10
dB/



CENTER 4.804 GHz
#RES BW 5.0 MHz
VBW 3 MHz
SPAN 3.203 GHz
SWP 64.1 msec

VA SB
SC FC
CORR

CLEAR
WRITE A

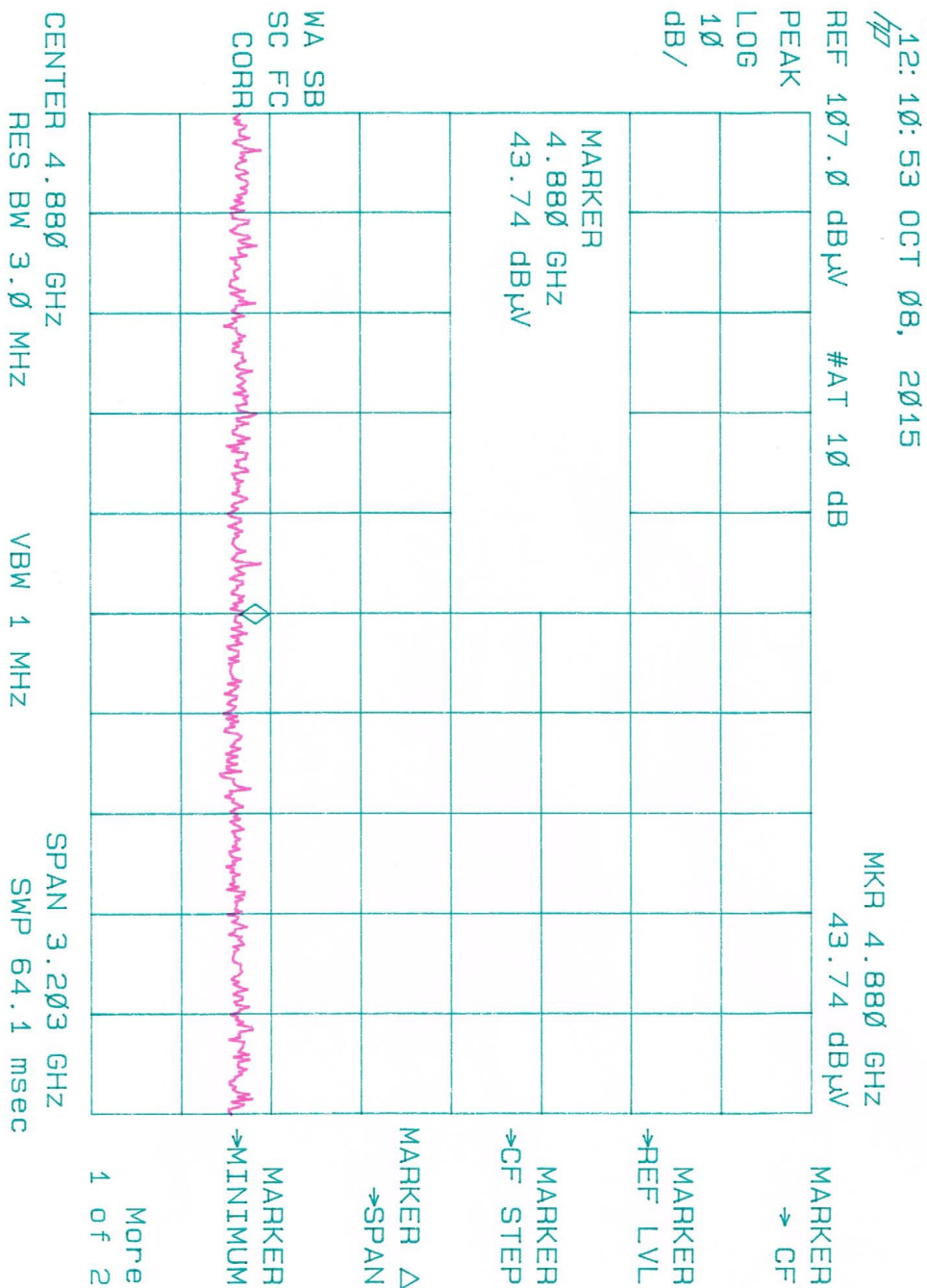
MAX
HOLD A

VIEW A

BLANK A

Trace
A B C

More
1 of 3



12:15:21 OCT 08, 2015

REF 107.0 dBµV #AT 10 dB

MKR 4.960 GHz
43.86 dBµV

PEAK
LOG
10
dB/

CENTER
FREQ

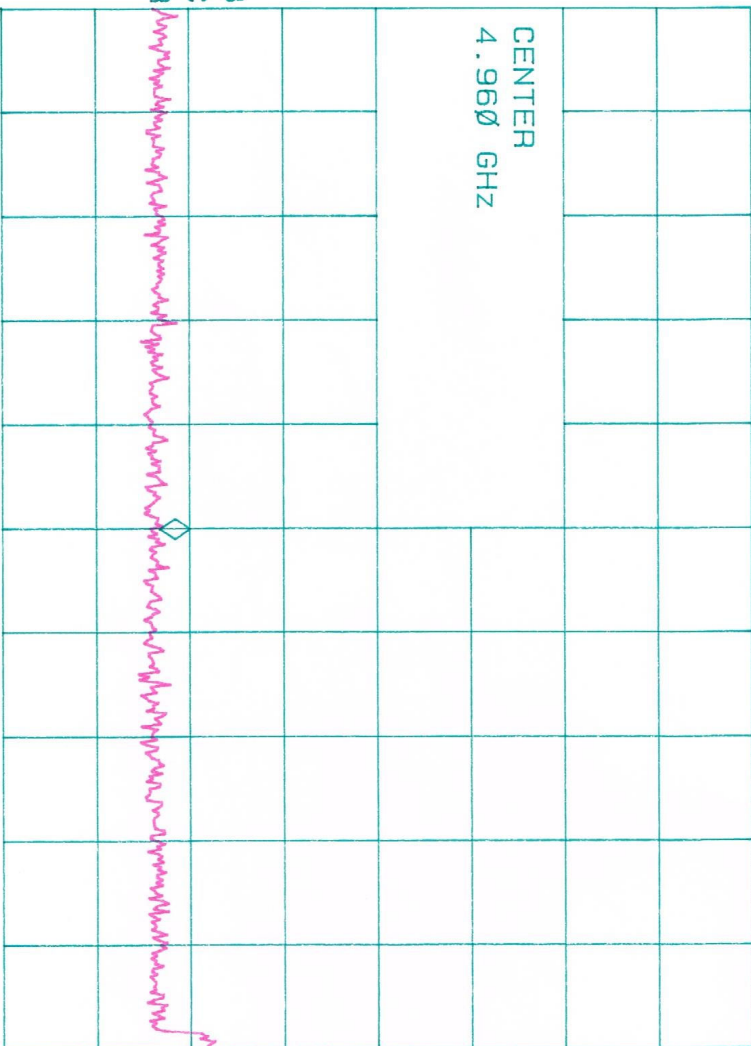
START
FREQ

STOP
FREQ

CF STEP
AUTO MAN

FREQ
OFFSET

Band
Lock



CENTER 4.960 GHz
RES BW 3.0 MHz
VBW 1 MHz
SPAN 3.203 GHz
SWP 83.0 msec