ELECTRONIC SYSTEMS, INC.
166 South Carter, Genoa City, WI 53128

Company: Koss Corporation
Model Tested: STRIVΛ TΛP
Report Number: 17285

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart C – Intentional Radiators
Section 15.247
Operation within the bands 902 - 928 MHz,
2400 - 2483.5 MHz, 5725 - 5875 MHz,
and 24.0 - 24.25 GHz.

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	Striva Tap
Kind of Equipment:	Wireless Stereo Headphone
Frequency Range:	2412 - 2462 MHz
Test Configuration:	Portable
Model Number(s):	STRIVΛ TΛP
Model(s) Tested:	STRIVΛ TΛP (designated CC4.5 on test sample)
Serial Number(s):	D3C4FE54C02250000139, 6F85EBB7C02250000163, 1DB14483C02250000171, 10E18FB3C02250000172, 67B98FB6C02250000192, 5FB90D1DC02250000193, FB82992DC02250000194, BD5A4C1DC02250000169
Date of Tests:	September 19th through 23rd, 2011 and December 8th through 13th, 2011
Test Conducted For:	Koss Corporation 4129 North Port Washington Road Milwaukee, WI, 53212, USA

NOTICE: "This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government". Please see the "Description of Test Sample" page listed inside of this report.

SIGNATURE PAGE

Report By:

Craig Brandt
Test Engineer

Reviewed By:

William Stumpf
OATS Manager

Approved By:

Brian Mattson
General Manager

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United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

D.L.S. Electronic Systems, Inc.

Wheeling, IL

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2010-10-01 through 2011-09-30
Effective dates

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)

1.0 Summary of Test Report

It was determined that the Koss Corporation Striva Tap, Model STRIVΛ TΛP, complies with the requirements of CFR 47 Part 15 Subpart C Section 15.247.

Subpart C Section 15.247 Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
15.247(a)(2)	6 dB Emission Bandwidth	FCC Publication KDB 558074	1	Yes
15.247(b)(3)	Maximum Peak Conducted Output Power	FCC Publication KDB 558074	1	Yes
15.247(d)	RF Conducted Spurious	FCC Publication KDB 558074	1	Yes
15.247(d)	Band Edge	FCC Publication KDB 558074	1,2	Yes
15.247(e)	Power Spectral Density	FCC Publication KDB 558074	1	Yes
15.247 (d), 15.205	Radiated Harmonics in Restricted Band	ANSI C63.4-2009 & ANSI C63.10-2009	2	Yes
15.247(d), 15.205(c), 15.209(a)	Radiated Spurious Emissions other than Harmonics	ANSI C63.4-2009 & ANSI C63.10-2009	2	Yes
15.35(c)	Duty Cycle	ANSI C63.4-2009 & ANSI C63.10-2009		NA
15.207(a)	AC Line Conducted Emissions	ANSI C63.4-2009 & ANSI C63.10-2009		Yes

Note 1: RF conducted measurement.
Note 2: Radiated emission measurement.

2.0 Introduction

In September and December, 2011 the Striva Tap, Model STRIVΛ TΛP, as provided from Koss Corporation, was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.247. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.

3.0 Test Facilities

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at http://www.dlsemc.com/certificate. Our facilities are registered with the FCC, Industry Canada, and VCCI.

Wisconsin Test Facility:
D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128

Wheeling Test Facility:
D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090

4.0 Description of Test Sample

Description:

The Striva Tap is a pair of stereo ear buds with black foam tips designed to allow the ear buds to be inserted into the ear and remain there without assistance. The ear buds are black with red accents. On each ear bud there is a raised ridge that indicates the presence of a volume control slider sensor. A micro-USB jack on the lower rim of the ear bud. Near the projection for the foam cover, there is a small light pipe flush with the surface that is lit by an LED from below. Functionally, the unit is a wireless receiver, using WiFi to stream music from a remote source.

Type of Equipment / Frequency Range:

Portable / 2412-2462 MHz

Physical Dimensions of Equipment Under Test:

Length: 1.50 in. Width: 1.00 in. Height: 0.75 in.

Power Source:

3.7 VDC rechargeable battery or USB powered.

Internal Frequencies:

2000 or 1000 kHz;

40, 24 MHz

Transmit / Receive Frequencies Used For Test Purpose:

Section 15.247: Low channel: 2412 MHz, Middle channel: 2437 MHz, High channel: 2462 MHz

Type of Modulation(s) / Antenna Type:

CSMA/CA / SMT Chip antenna (-0.5 dBi gain)

Description of Circuit Board(s) / Part Number:

Main PCB	CC04.5rev2

Crystal Information

Compliance testing was done using the KDS P/N 1B940000BB0A crystal and re-verified using the ECS P/N 400-8-36-CKM-740 crystal. Both crystals have the same specifications. No difference was noted.

5.0 Test Equipment

A list of the equipment used can be found in the table below. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

D.L.S. Wisconsin

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	7/17/11	7/17/12
Preamplifier	Rohde & Schwarz	TS-PR10	032001/003	9 kHz – 1 GHz	1/11/11	1/11/12
Antenna	EMCO	3104C	9810-4849	20 MHz – 200 MHz	2/16/10	2/16/12
Antenna	EMCO	3146	1604	200 MHz – 1 GHz	8/25/10	8/25/12
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	1/25/11	1/25/12
Horn Antenna	EMCO	3115	9502-4451	1-18GHz	4/11/11	4/11/13
Filter- High-Pass	Q-Microwave	100462	1	4.2GHz-18GHz	5/3/11	5/3/12
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18GHz-26GHz	8/5/11	8/5/12
Horn Antenna	A.H. Systems	SAS-574	222	18 – 40GHz	5/4/10	5/4/12
High Pass Filter	Planar Filter Co.	CL22600-9000-CD-SS	PF1229/7728	18 – 40GHz	8/3/11	8/3/12
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	4/11/11	4/11/12
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	6/6/11	6/6/12
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	1/11/11	1/11/12
Limiter	Electro-Metrics	EM-7600	706	9 kHz – 30 MHz	1/11/11	1/11/12
20 dB attenuator	Aeroflex/weinschel	75A-20-12	1071	DC – 40 GHz	6/29/11	6/29/12
20 dB attenuator	Anritsu	42N50-20	451	DC – 18 GHz	1/11/11	1/11/12
Wideband Power Meter	Anritsu	ML2487A	SK00002069	100 kHz – 65 GHz	3/4/11	3/4/12
Power Sensor	Anritsu	MA2490A	031563	50 MHz – 8 GHz	3/7/11	3/7/12

6.0 Test Arrangements

Radiated Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.4-2009 and ANSI C63.10-2009, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

RF Conducted Emissions Measurement Arrangement:

All RF conducted emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.4-2009 and ANSI C63.10-2009, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up.

7.0 Test Conditions

Normal Test Conditions:

Temperature and Humidity:

70°F at 50% RH

Supply Voltage:

3.7 VDC

8.0 Modifications Made To EUT For Compliance

Section 15.247: No modifications made at time of test.

9.0 Additional Descriptions

The EUT was connected to the measuring equipment through a temporary connector/cable for RF conducted measurements.

Special test software was installed in the EUT for measurements requiring the EUT to transmit continuously at a single channel.

The test sample was designated as model CC4.5. This model number was only used for the test sample.

10.0 Results

Measurements were performed in accordance with ANSI C63.4-2009 and ANSI C63.10-2009. Graphical and tabular data can be found in Appendix B at the end of this report.

11.0 Conclusion

The Striva Tap, Model STRIVΛ TΛP, as provided from Koss Corporation, tested in September and December, 2011 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.247.

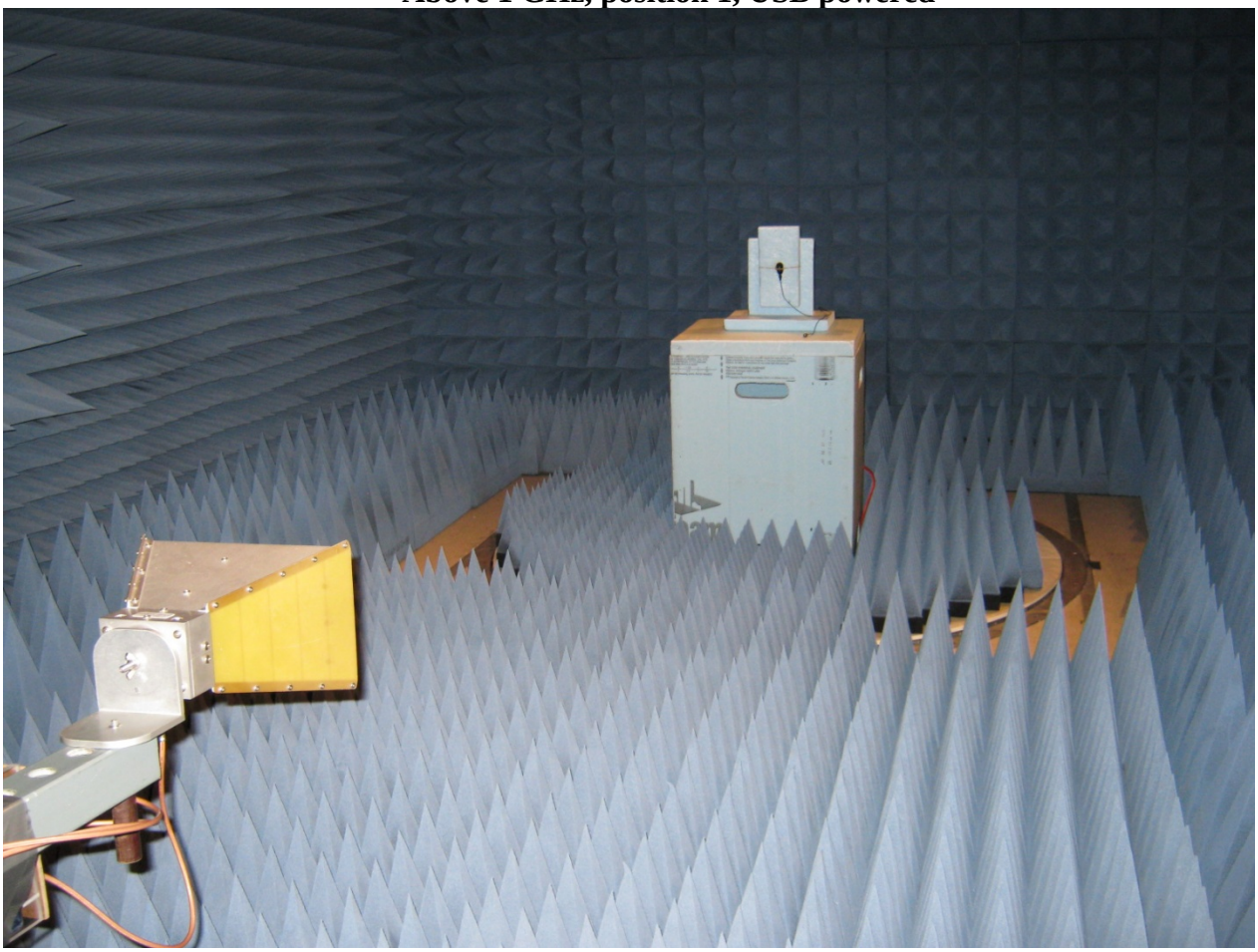
Appendix A – Test Photos

Photo Information and Test Setup:

Item0: Striva Tap, Model STRIVΛ TΛP
Item1: One meter shielded USB cable with metal connectors
Item2: I.T.E. Power Supply model SAW06-05.0-1000USC

Radiated Emissions

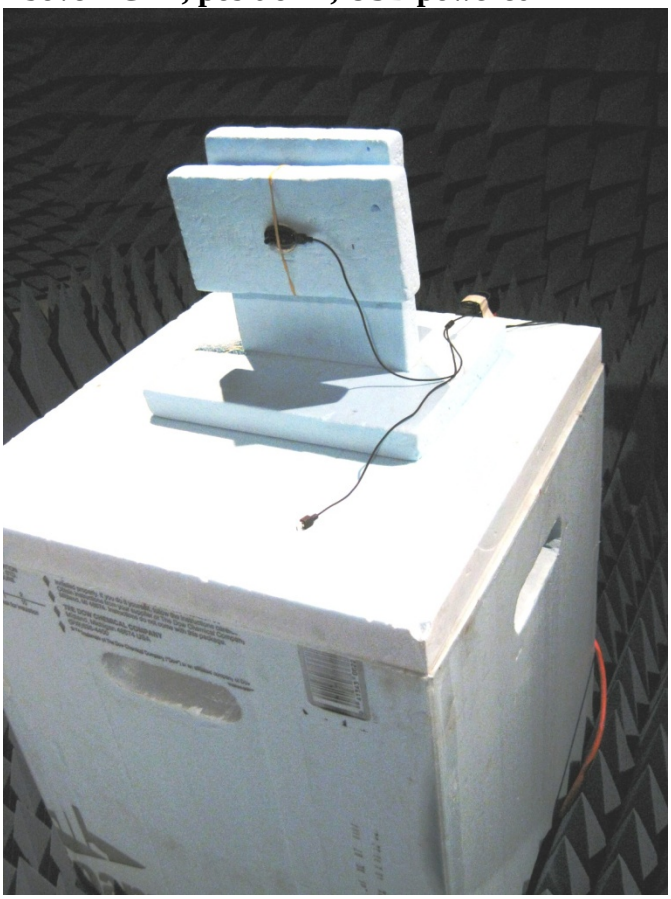
Above 1 GHz, position 1, USB powered



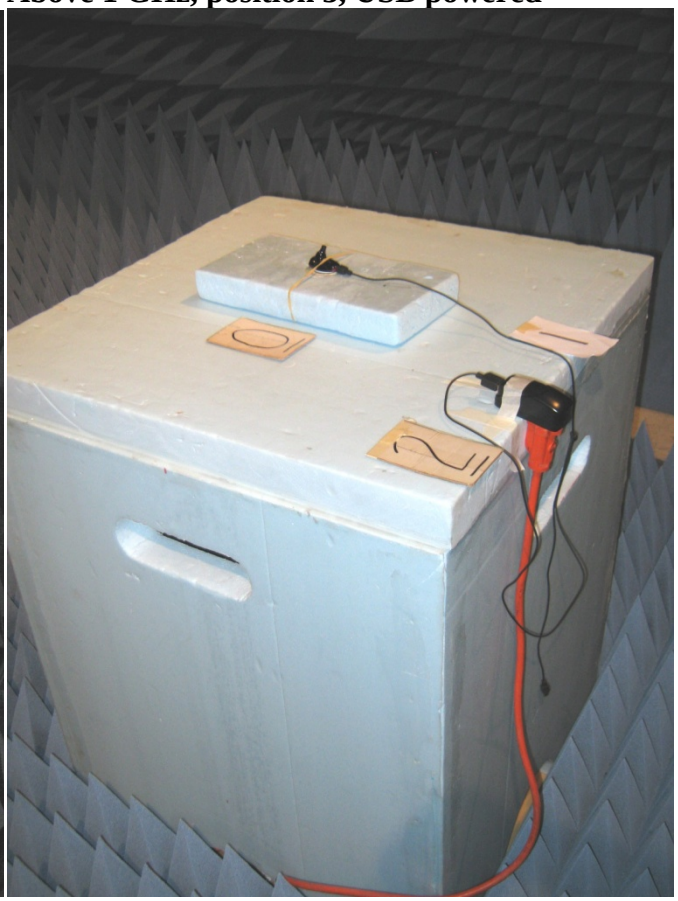
Appendix A

Radiated Emissions

Above 1 GHz, position 2, USB powered



Above 1 GHz, position 3, USB powered



Appendix A

Radiated Emissions

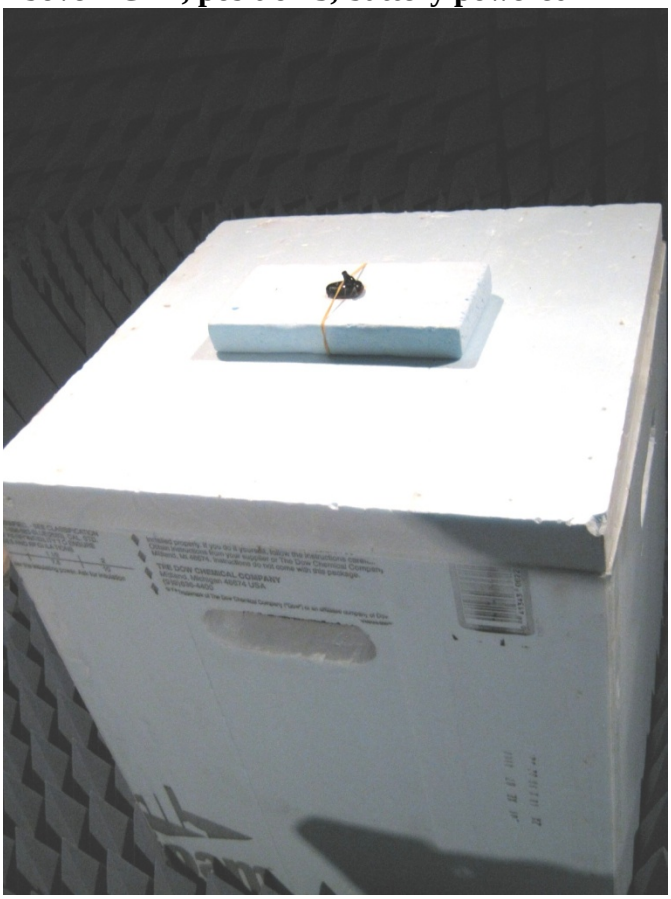
Above 1 GHz, position 1, battery powered

Above 1 GHz, position 2, battery powered

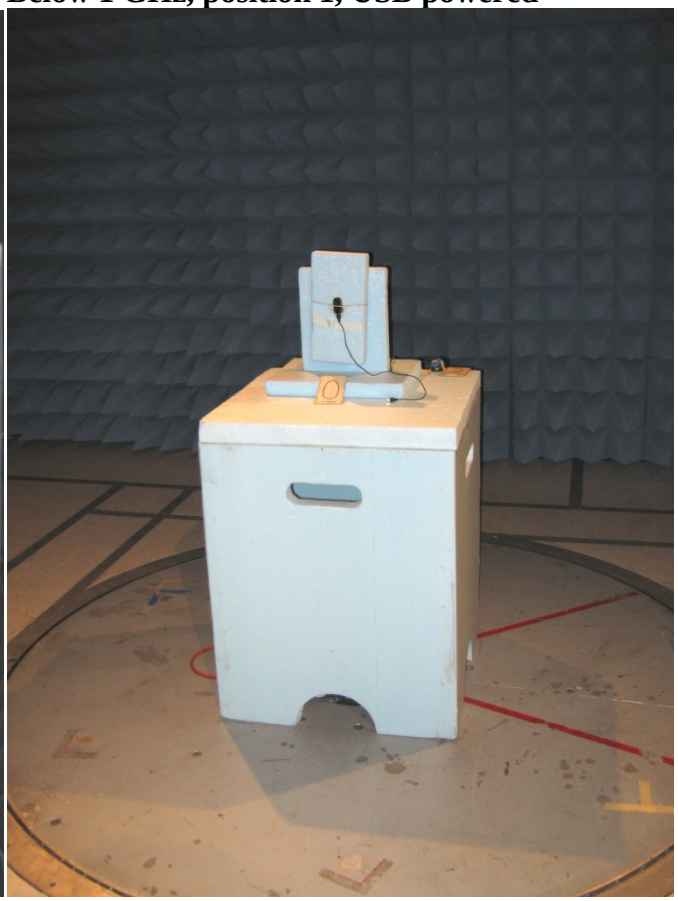
Appendix A

Radiated Emissions

Above 1 GHz, position 3, battery powered



Below 1 GHz, position 1, USB powered



Appendix A

Radiated Emissions

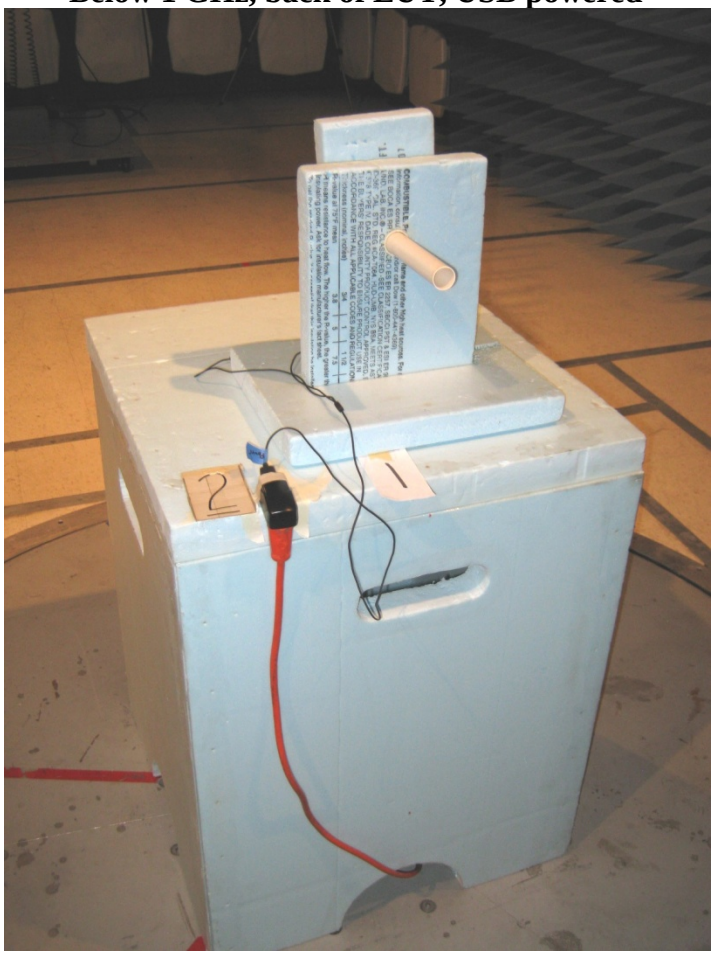
Below 1 GHz, position 2, USB powered

Below 1 GHz, position 3, USB powered

Appendix A

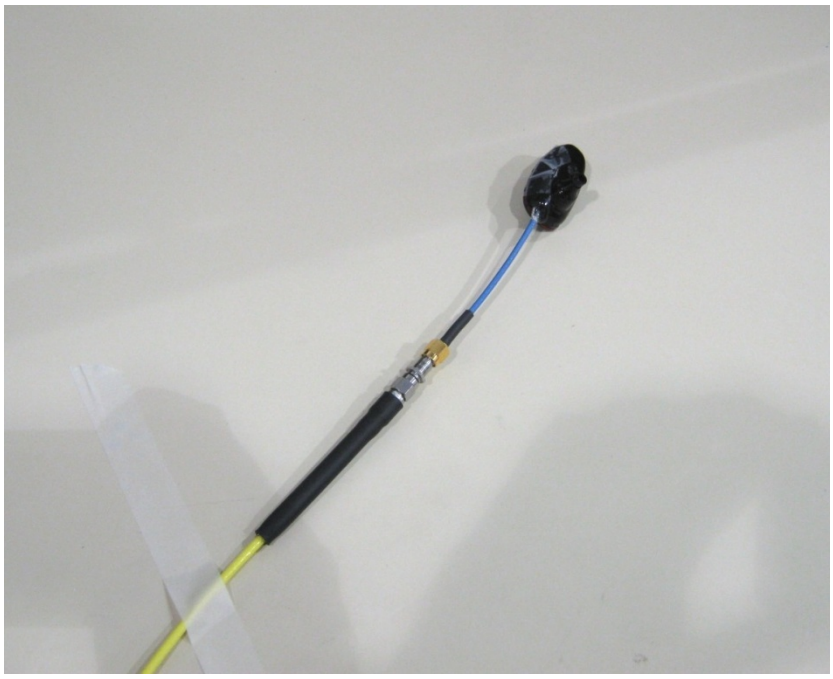
Radiated Emissions

Below 1 GHz, back of EUT, USB powered

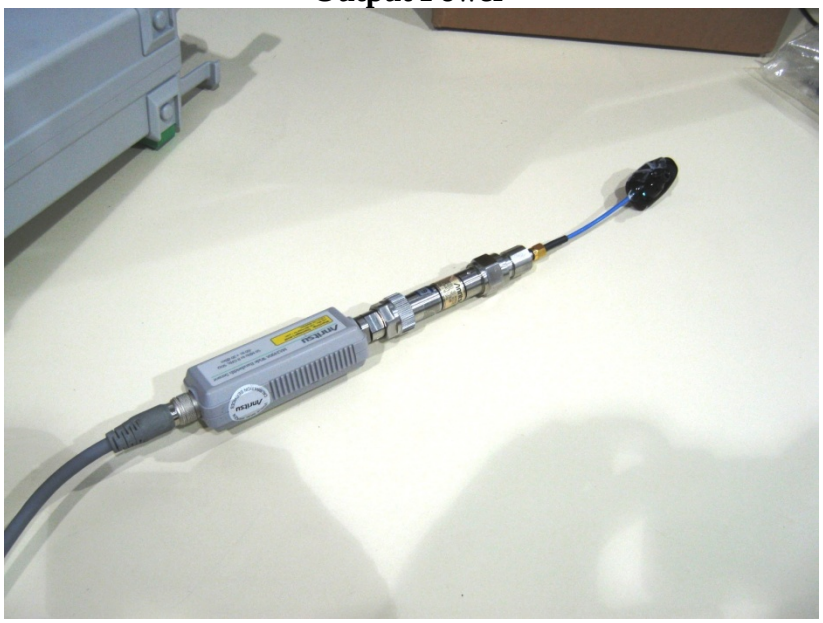


Appendix A

RF Conducted Emissions



Output Power



Appendix A

AC Line Conducted Emissions - Front

AC Line Conducted Emissions - Back

Appendix B – Measurement Data

B1.0 6 dB Emission Bandwidth – 80211.g mode

Rule Part: FCC Part 15.247(a)(2)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: Must be greater than 500 kHz.

Results: Compliant

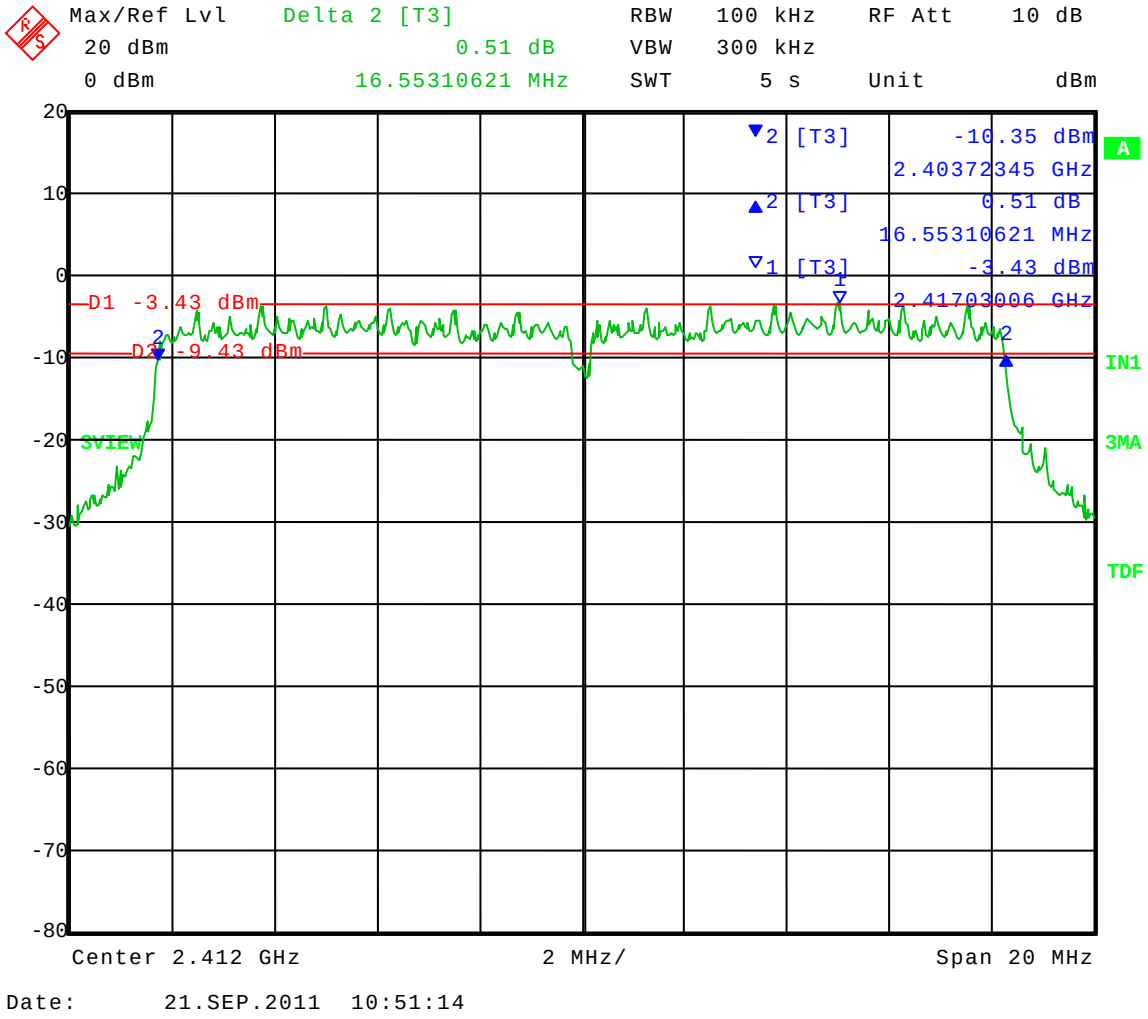
Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle.

Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: 6 dB Bandwidth - Conducted
Operator: Craig B

Comment: Low Channel: Frequency – 2.412 GHz
802.11g

6 dB Bandwidth = 16.5 MHz

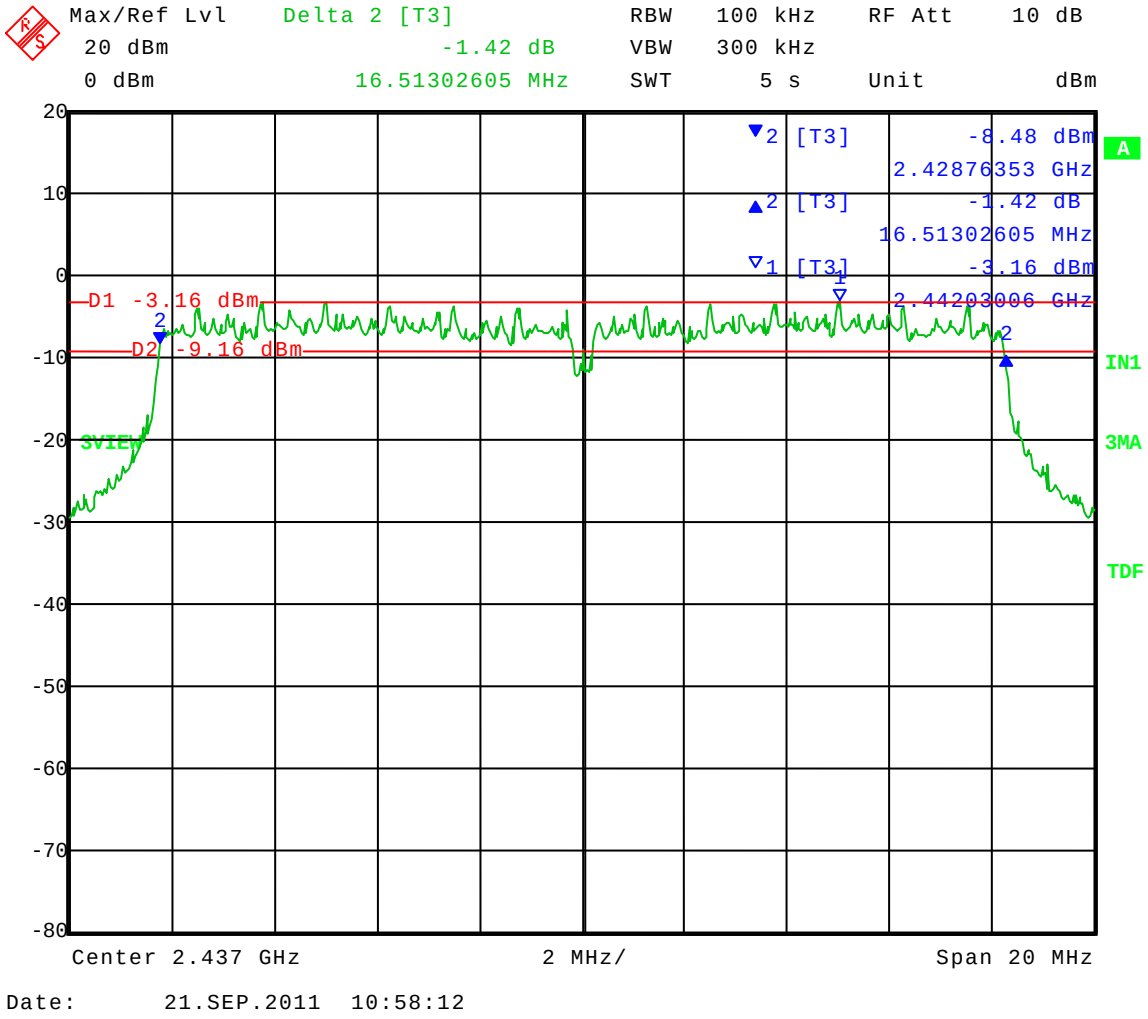


Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: 6 dB Bandwidth - Conducted
Operator: Craig B

Comment: Middle Channel: Frequency – 2.437 GHz
802.11g

6 dB Bandwidth = 16.5 MHz

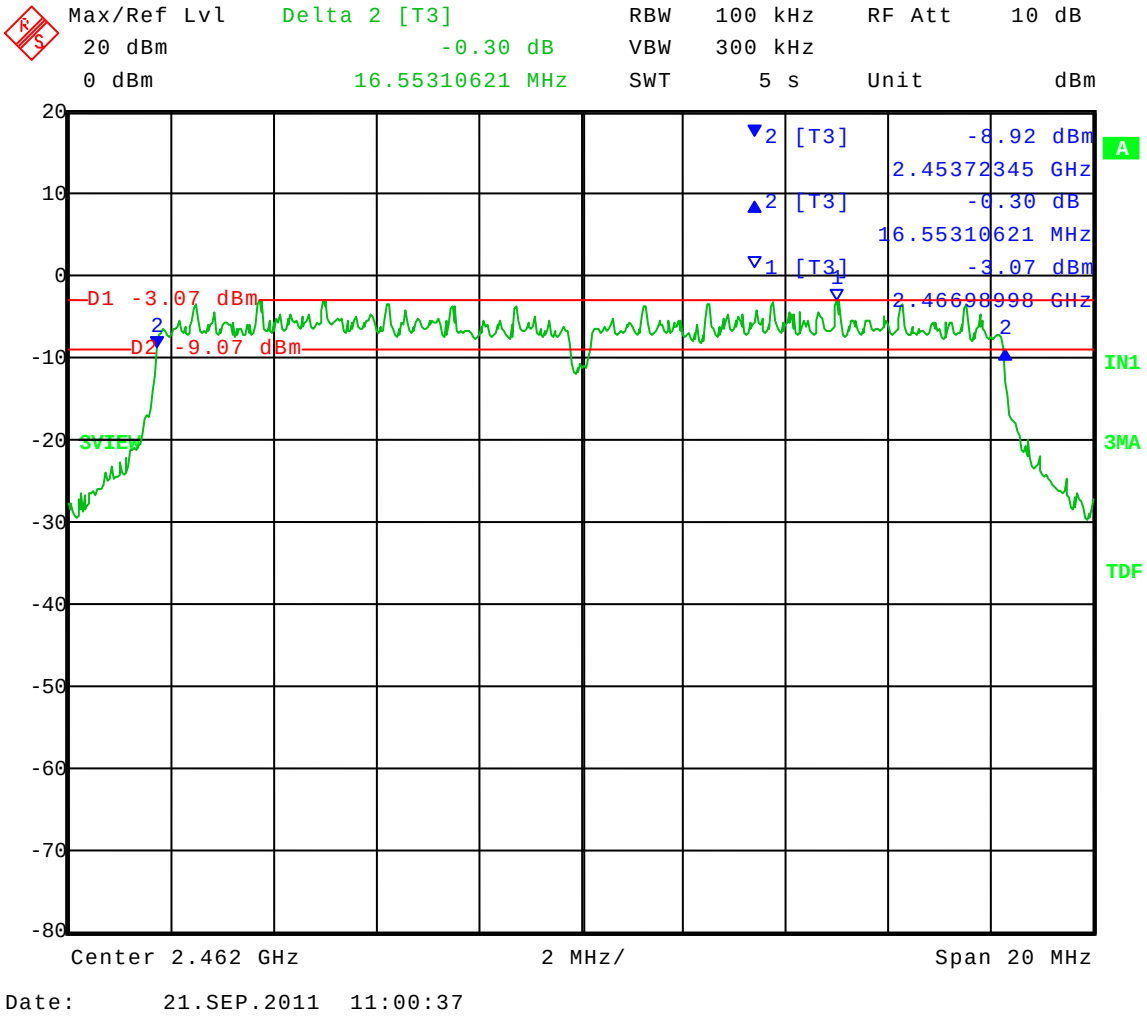


Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: 6 dB Bandwidth - Conducted
Operator: Craig B

Comment: High Channel: Frequency – 2.462 GHz
802.11g

6 dB Bandwidth = 16.5 MHz



Appendix B – Measurement Data

B1.1 6 dB Emission Bandwidth – 80211.b mode

Rule Part: FCC Part 15.247(a)(2)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: Must be greater than 500 kHz.

Results: Compliant

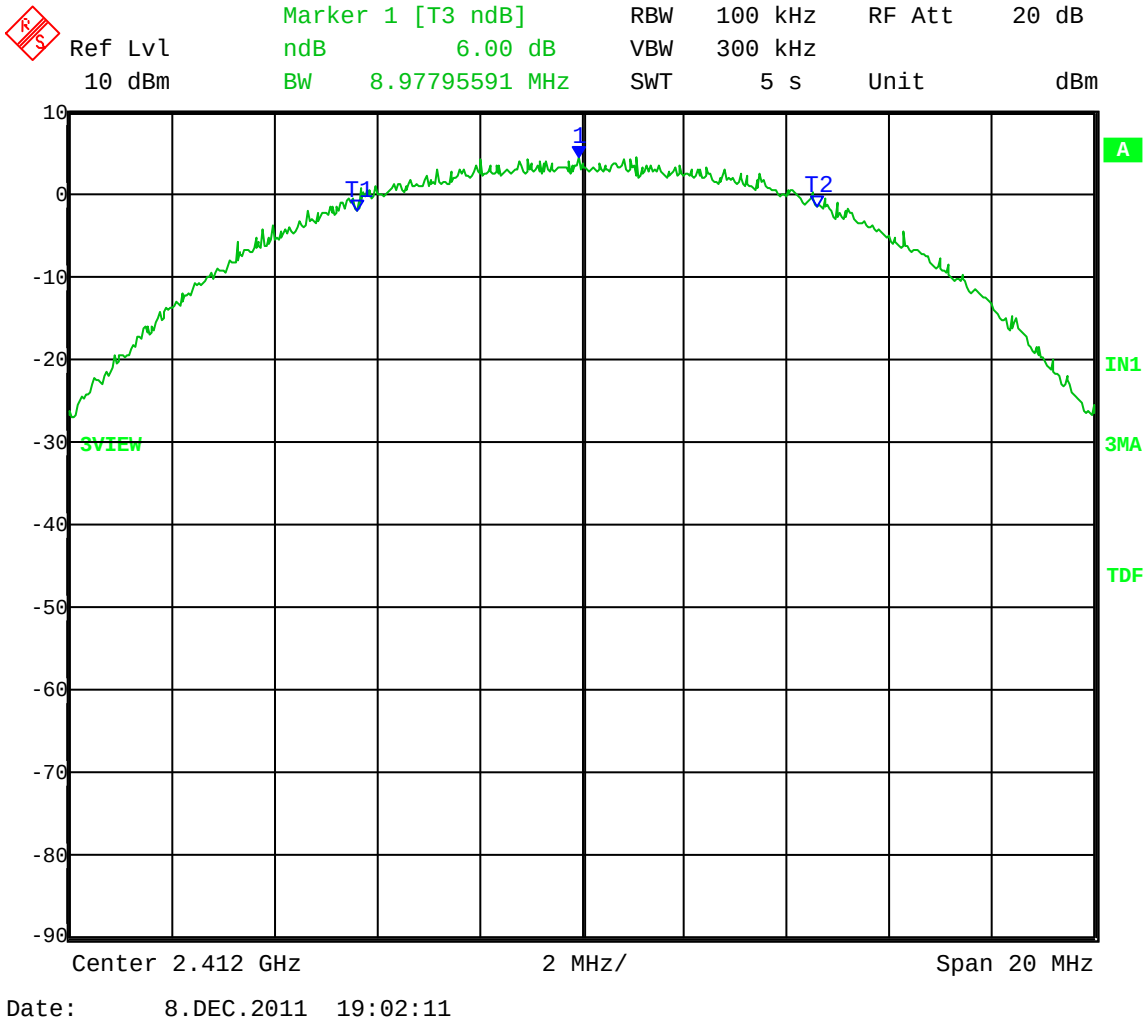
Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle.

Appendix B – Measurement Data

Test Date: 12-08-2011
Company: Koss Corporation
EUT: CC4.5
Test: 6 dB Bandwidth - Conducted
Operator: Craig B

Comment: Low Channel: Frequency – 2.412 GHz
802.11b

6 dB Bandwidth = 8.98 MHz

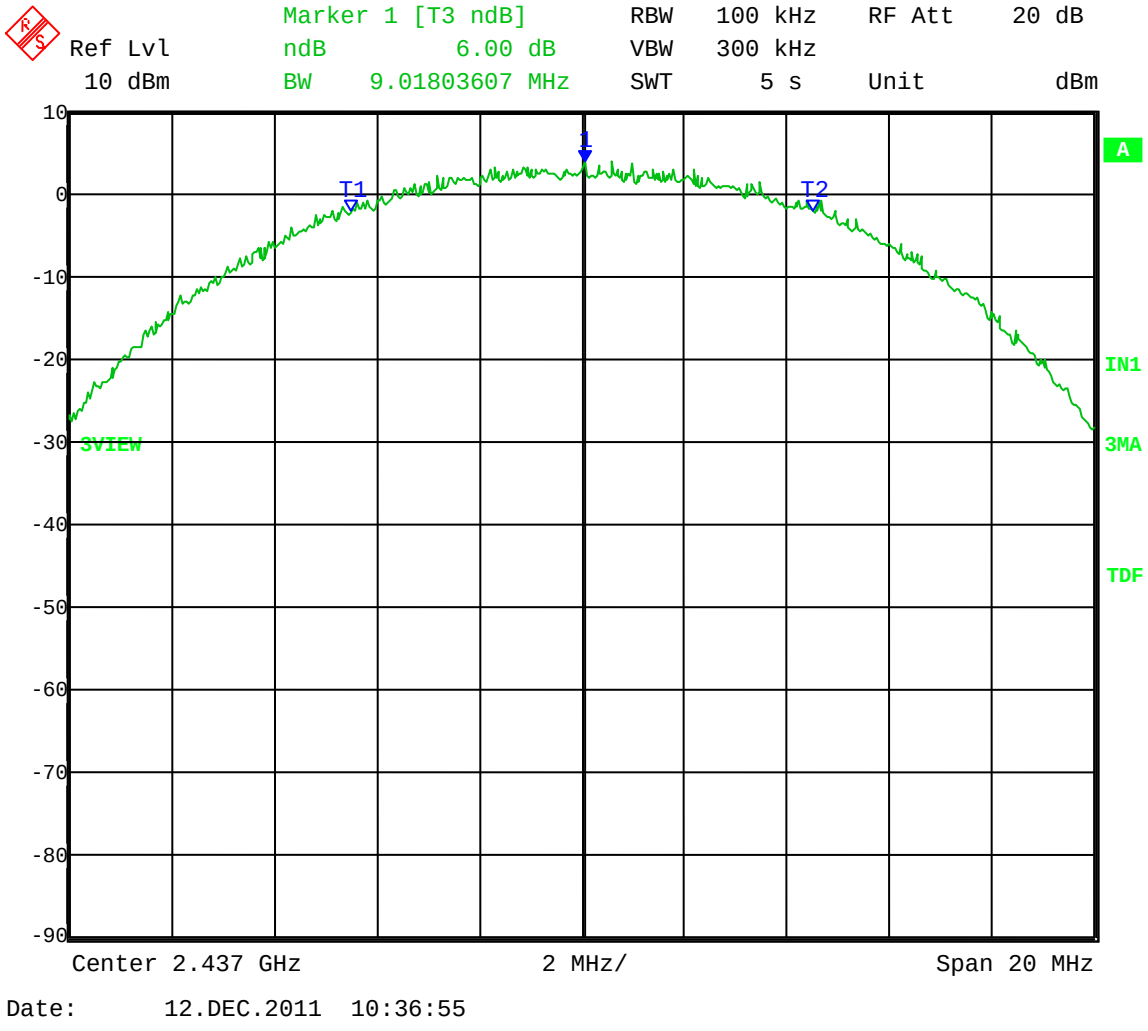


Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: 6 dB Bandwidth - Conducted
Operator: Craig B

Comment: Middle Channel: Frequency – 2.437 GHz
802.11b

6 dB Bandwidth = 9.02 MHz

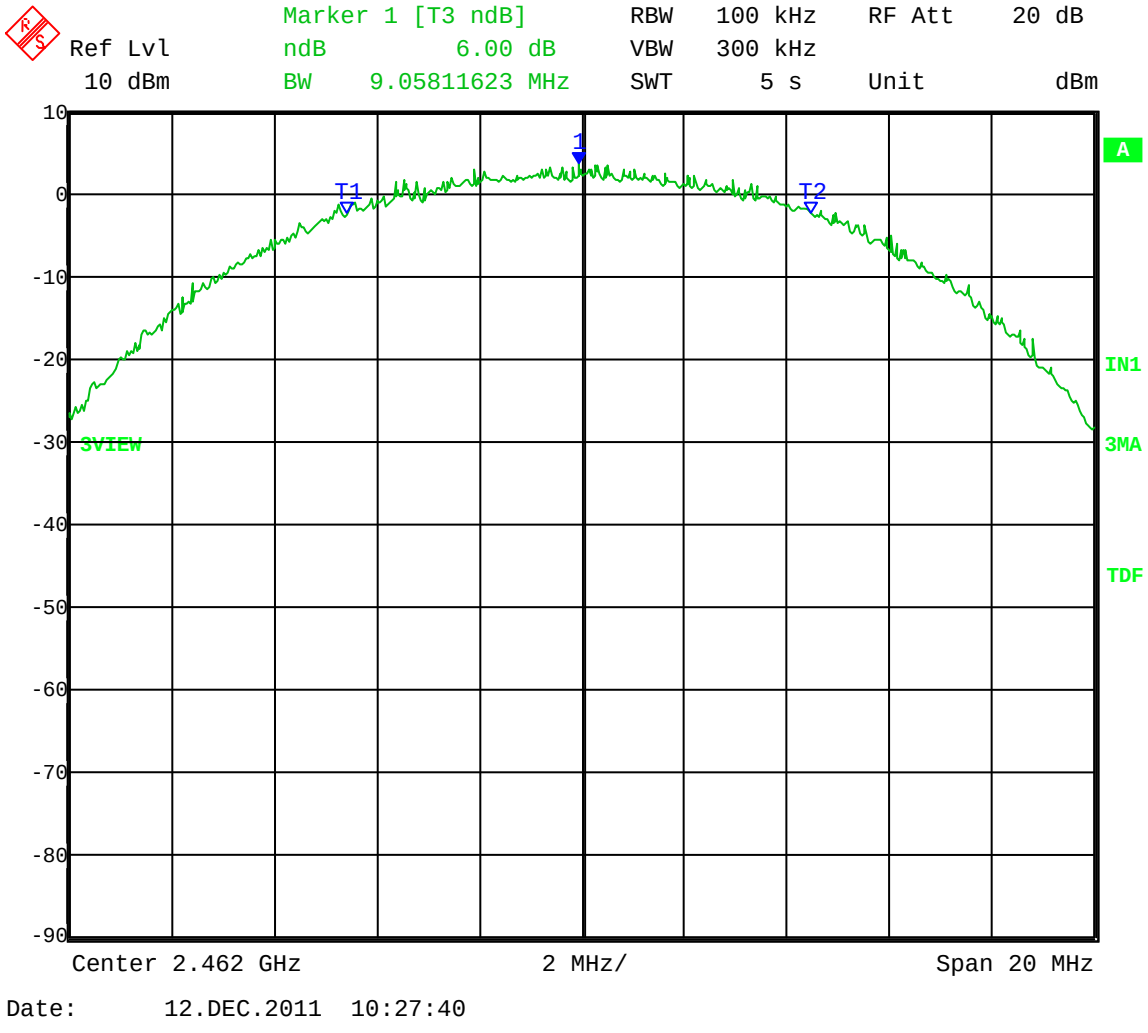


Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: 6 dB Bandwidth - Conducted
Operator: Craig B

Comment: High Channel: Frequency – 2.462 GHz
802.11b

6 dB Bandwidth = 9.06 MHz



Appendix B – Measurement Data

B2.0 Peak Output Power – 802.11g mode

Rule Part: FCC Part 15.247(b)(3)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: 1 Watt (30 dBm)

Results: Compliant

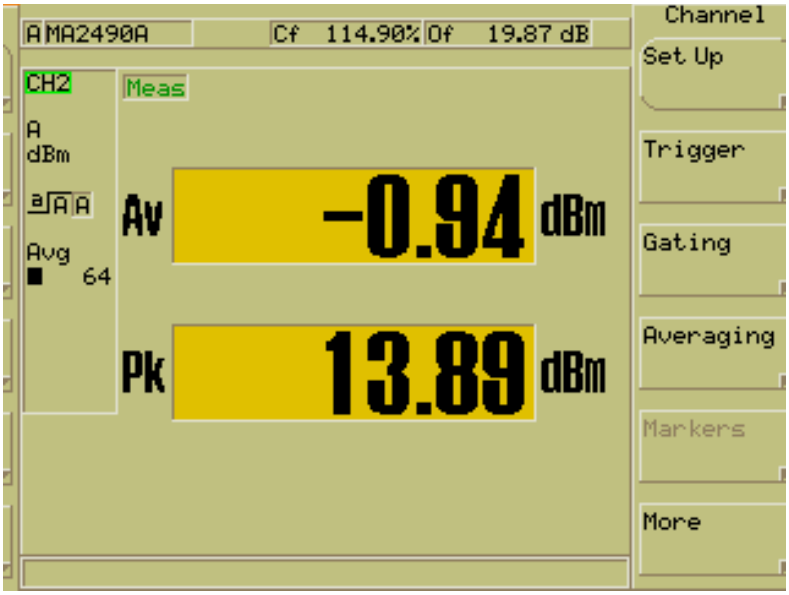
Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle. Output Power Option 1 was used for this test. Peak Output power was measured with a broadband power meter and power sensor.

Appendix B – Measurement Data

Test Date: 09-19-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Peak Power Output - Conducted
Operator: Craig B

Comment: Low Channel: Frequency – 2.412 GHz
802.11g

Peak Output Power = 13.89 dBm = **24.5 mW**



Appendix B – Measurement Data

Test Date: 09-19-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Peak Power Output - Conducted
Operator: Craig B

Comment: Mid Channel: Frequency – 2.437 GHz
802.11g

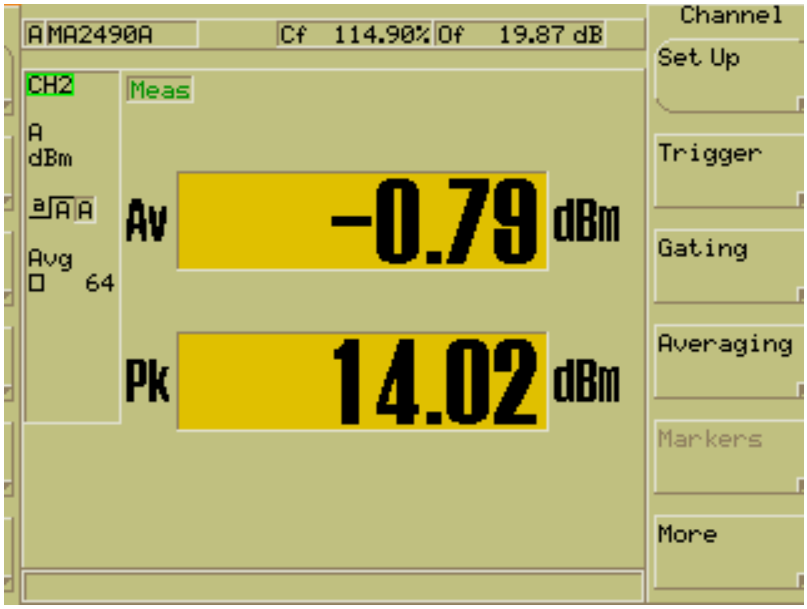
Peak Output Power = 13.95 dBm = **24.8 mW**

Appendix B – Measurement Data

Test Date: 09-19-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Peak Power Output - Conducted
Operator: Craig B

Comment: High Channel: Frequency – 2.462 GHz
802.11g

Peak Output Power = 14.02 dBm = **25.2 mW**



Appendix B – Measurement Data

B2.1 Peak Output Power – 802.11b mode

Rule Part: FCC Part 15.247(b)(3)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: 1 Watt (30 dBm)

Results: Compliant

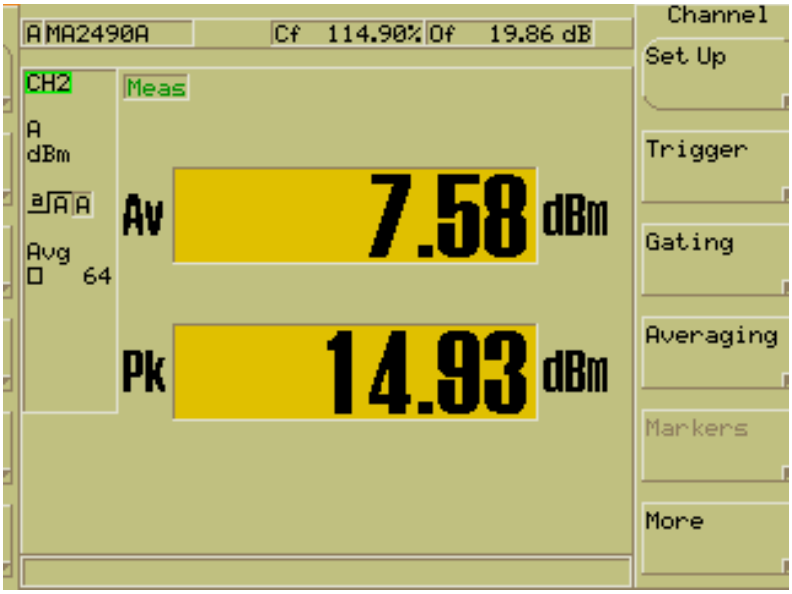
Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle. Output Power Option 1 was used for this test. Peak Output power was measured with a broadband power meter and power sensor.

Appendix B – Measurement Data

Test Date: 12-13-2011
Company: Koss Corporation
EUT: CC4.5
Test: Peak Power Output - Conducted
Operator: Craig B

Comment: Low Channel: Frequency – 2.412 GHz
802.11b

Peak Output Power = 14.93 dBm = **31.1 mW**

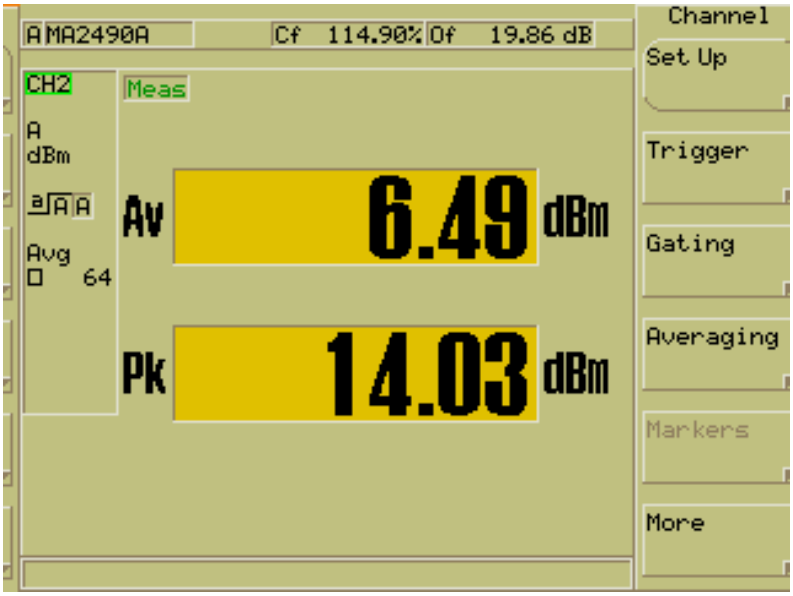


Appendix B – Measurement Data

Test Date: 12-13-2011
Company: Koss Corporation
EUT: CC4.5
Test: Peak Power Output - Conducted
Operator: Craig B

Comment: Mid Channel: Frequency – 2.437 GHz
802.11b

Peak Output Power = 14.03 dBm = **25.3 mW**

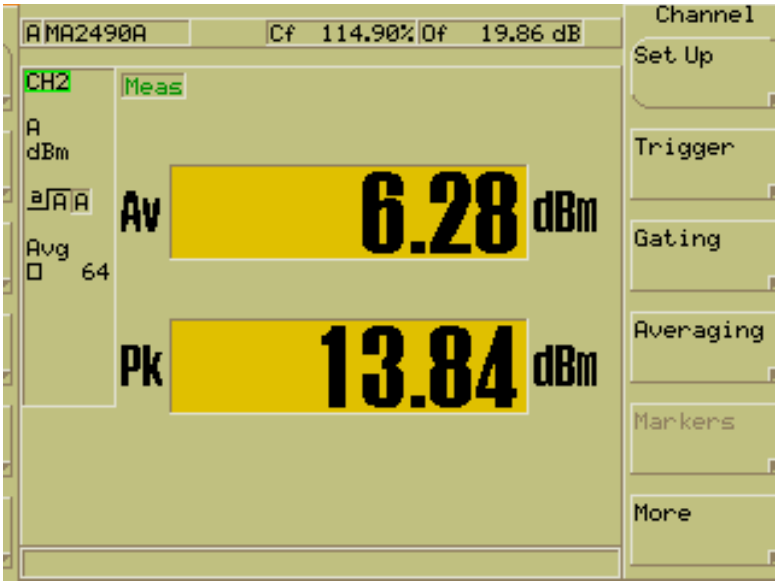


Appendix B – Measurement Data

Test Date: 12-13-2011
Company: Koss Corporation
EUT: CC4.5
Test: Peak Power Output - Conducted
Operator: Craig B

Comment: High Channel: Frequency – 2.462 GHz
802.11b

Peak Output Power = 13.84 dBm = **24.2 mW**



Appendix B – Measurement Data

B3.0 RF Conducted Spurious Emissions – 802.11g mode

Rule Part: FCC Part 15.247(d)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. (Device complies with Power Option 1).

Results: Compliant

Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle. A peak detector was used for this test.

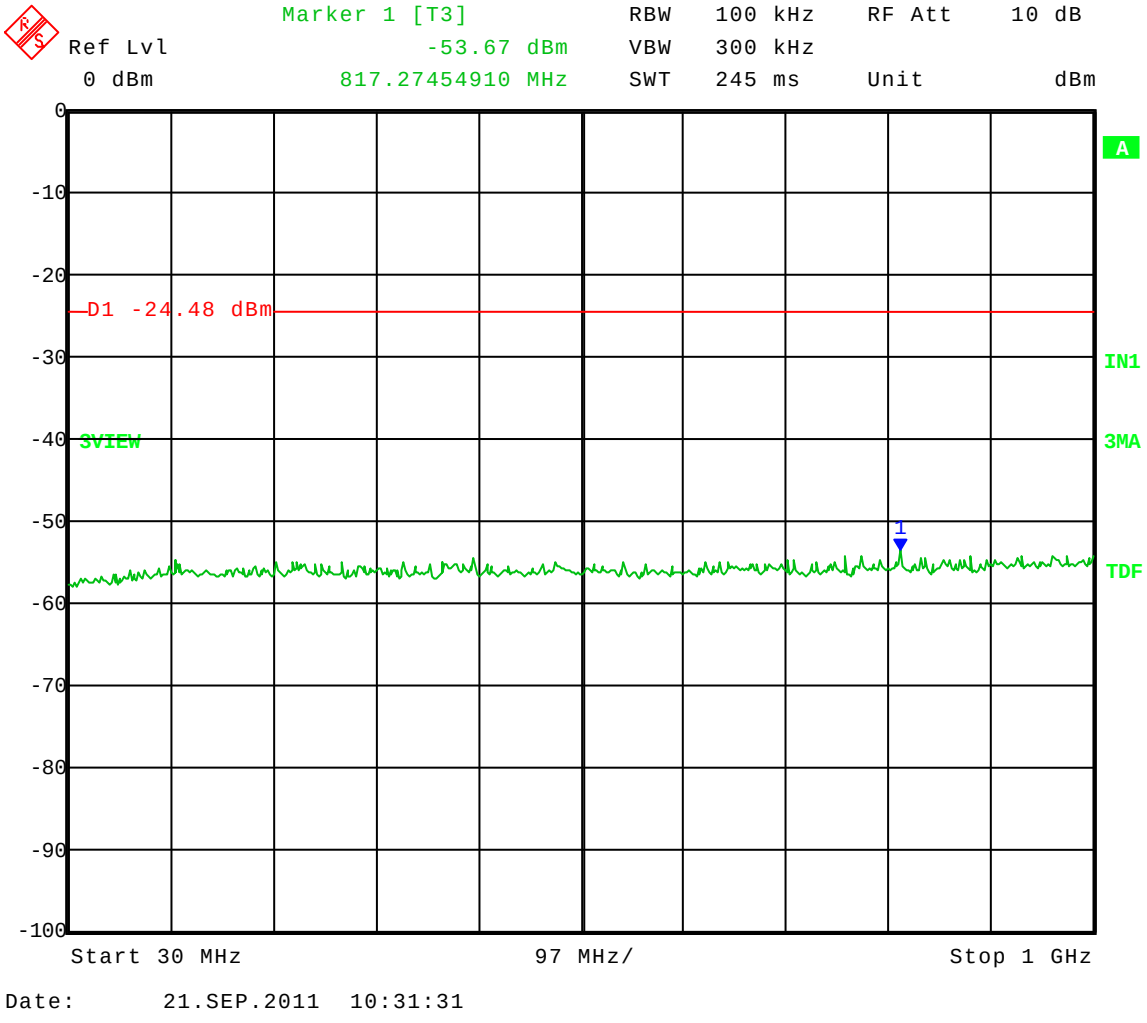
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Low Channel Transmit = 2.412 GHz
802.11g

Frequency Range: 30 to 1000 MHz
Limit = -24.48 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



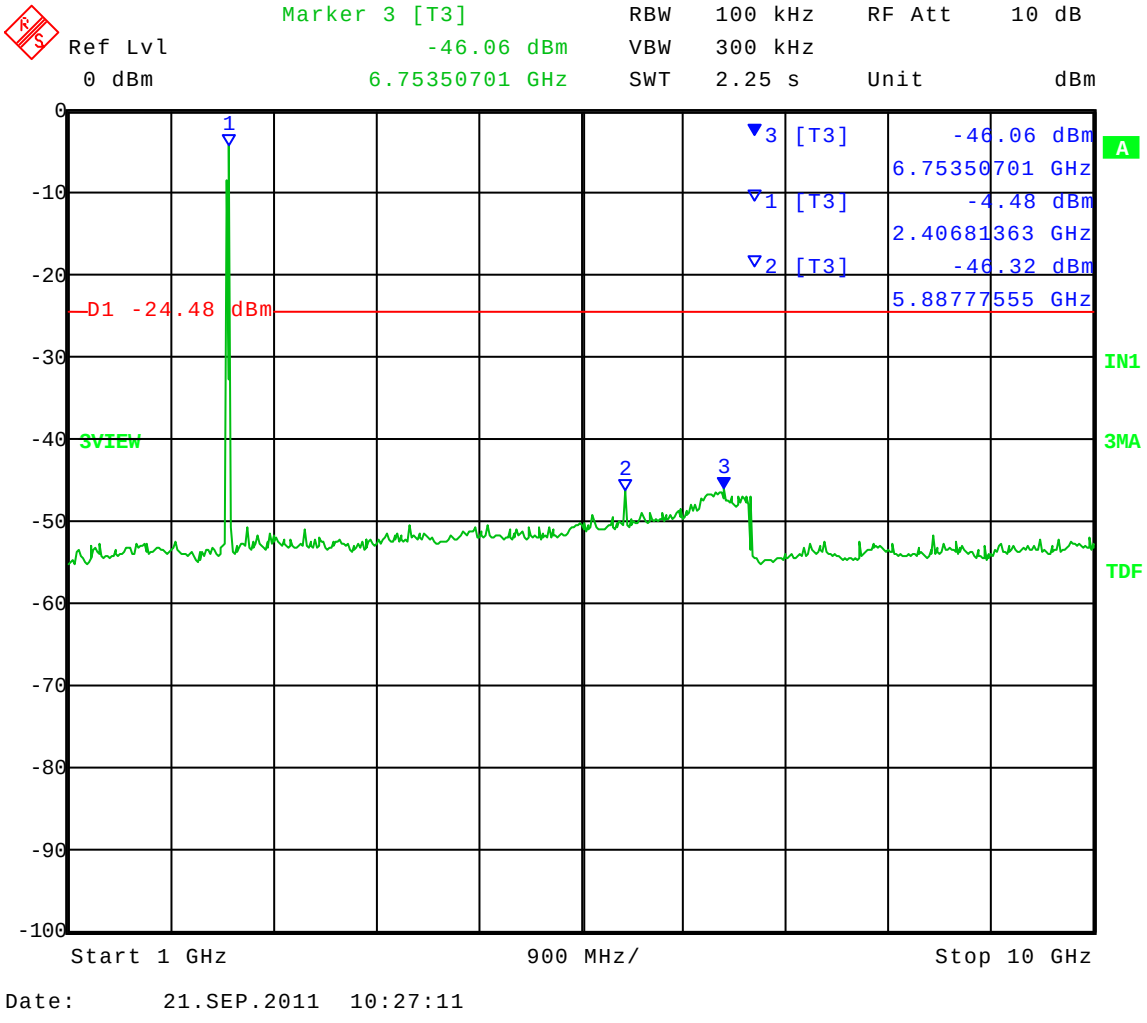
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Low Channel Transmit = 2.412 GHz
802.11g

Frequency Range: 1 to 10 GHz
Limit = -24.48 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



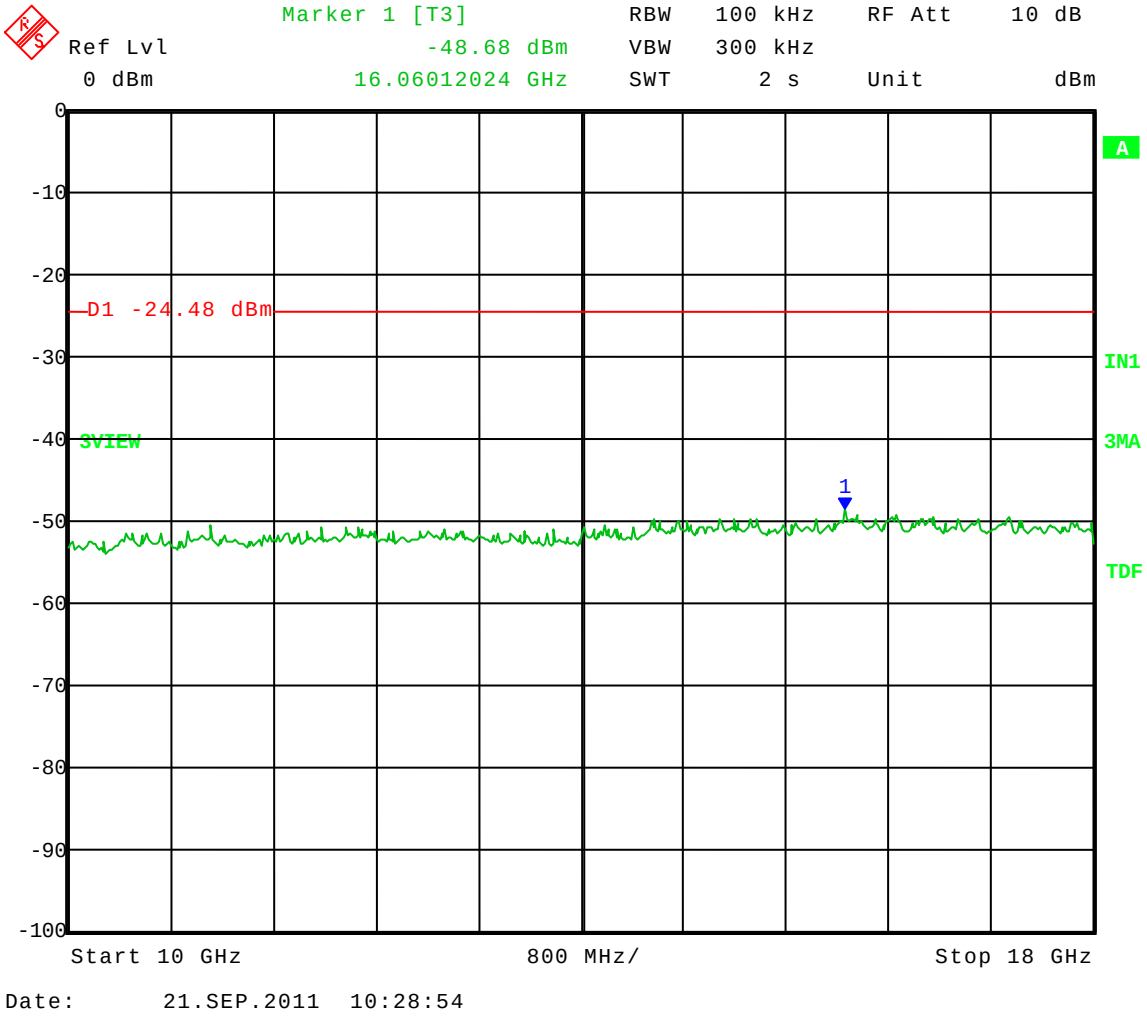
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Low Channel Transmit = 2.412 GHz
802.11g

Frequency Range: 10 to 18 GHz
Limit = -24.48 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



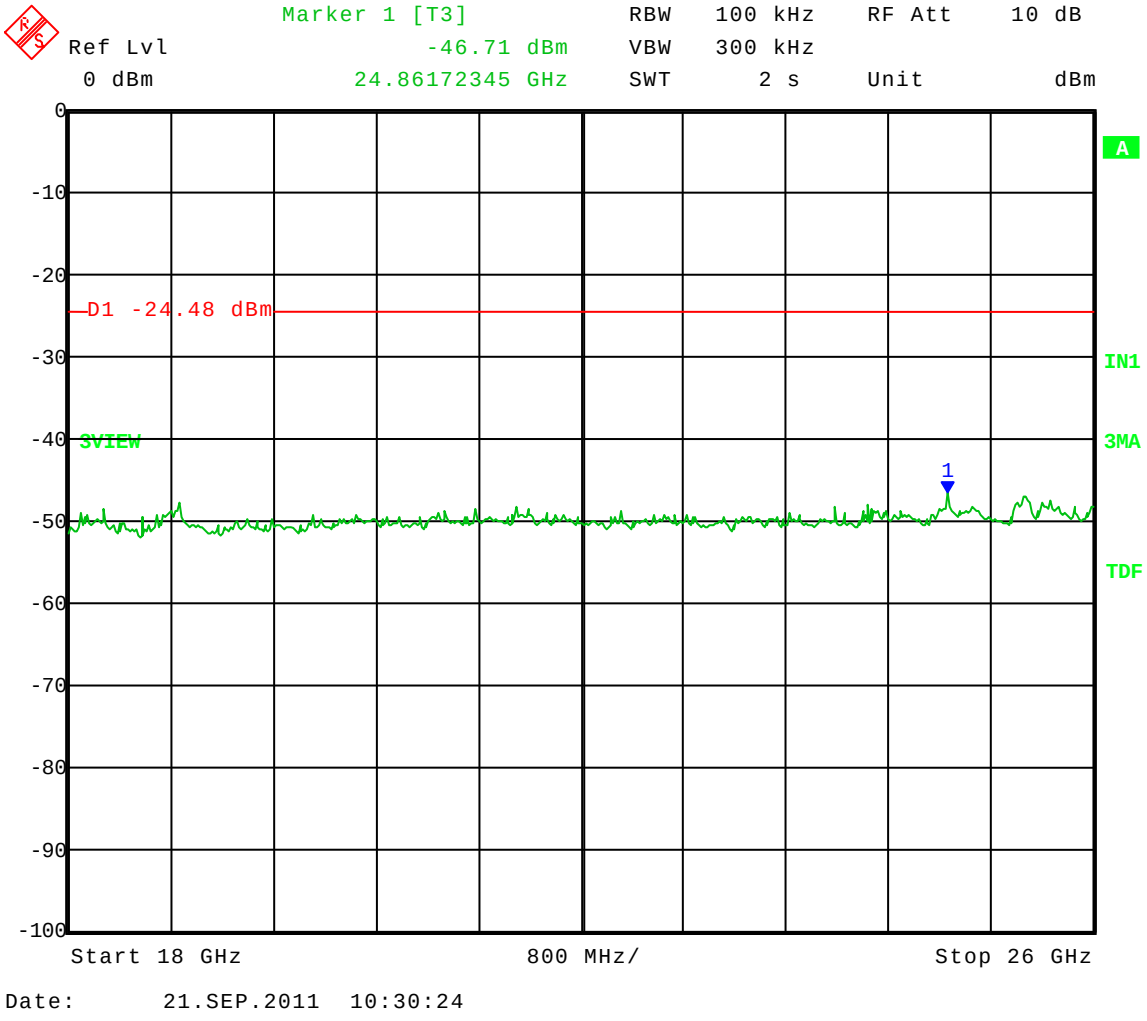
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Low Channel Transmit = 2.412 GHz
802.11g

Frequency Range: 18 to 26 GHz
Limit = -24.48 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



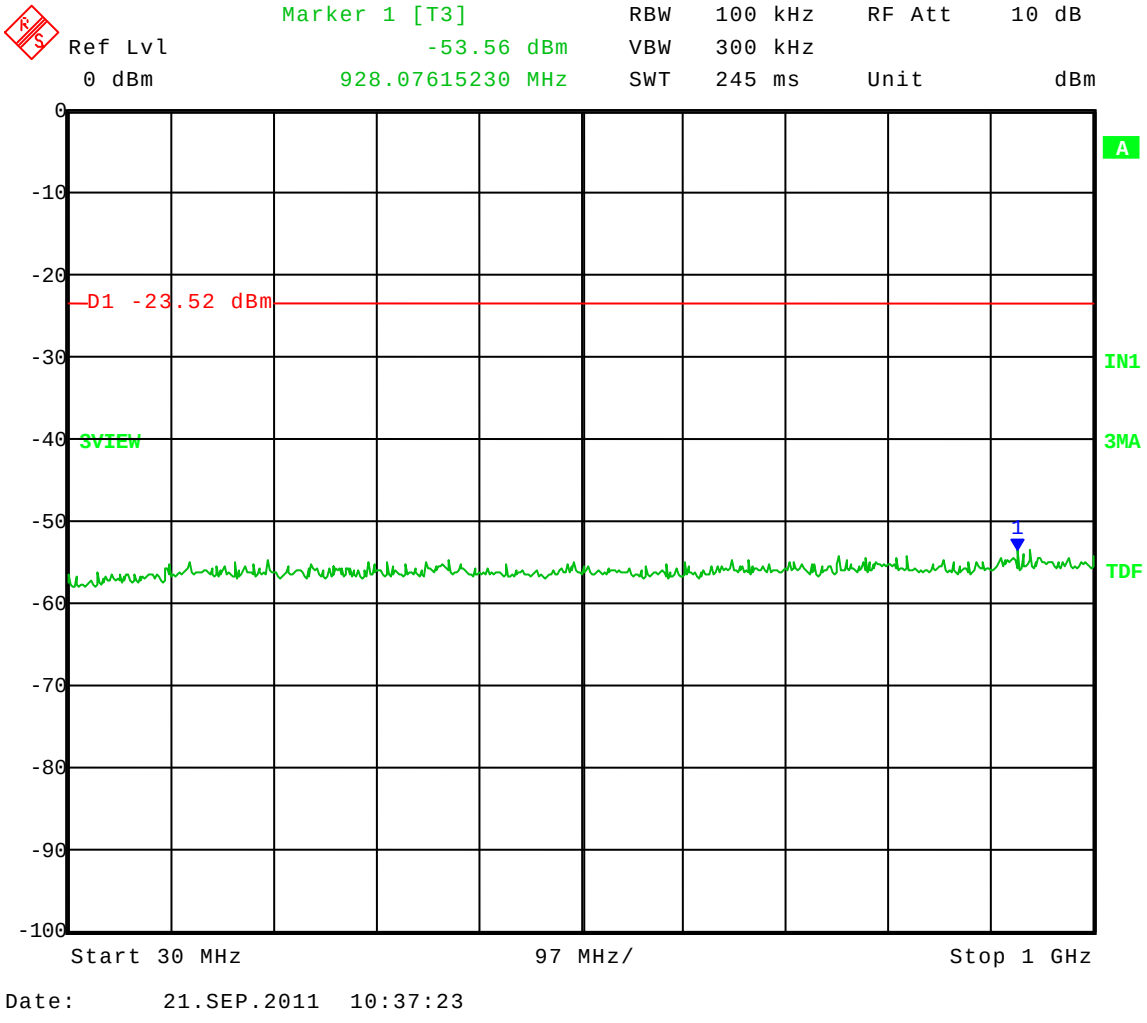
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Middle Channel Transmit = 2.437 GHz
802.11g

Frequency Range: 30 to 1000 MHz
Limit = -23.52 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



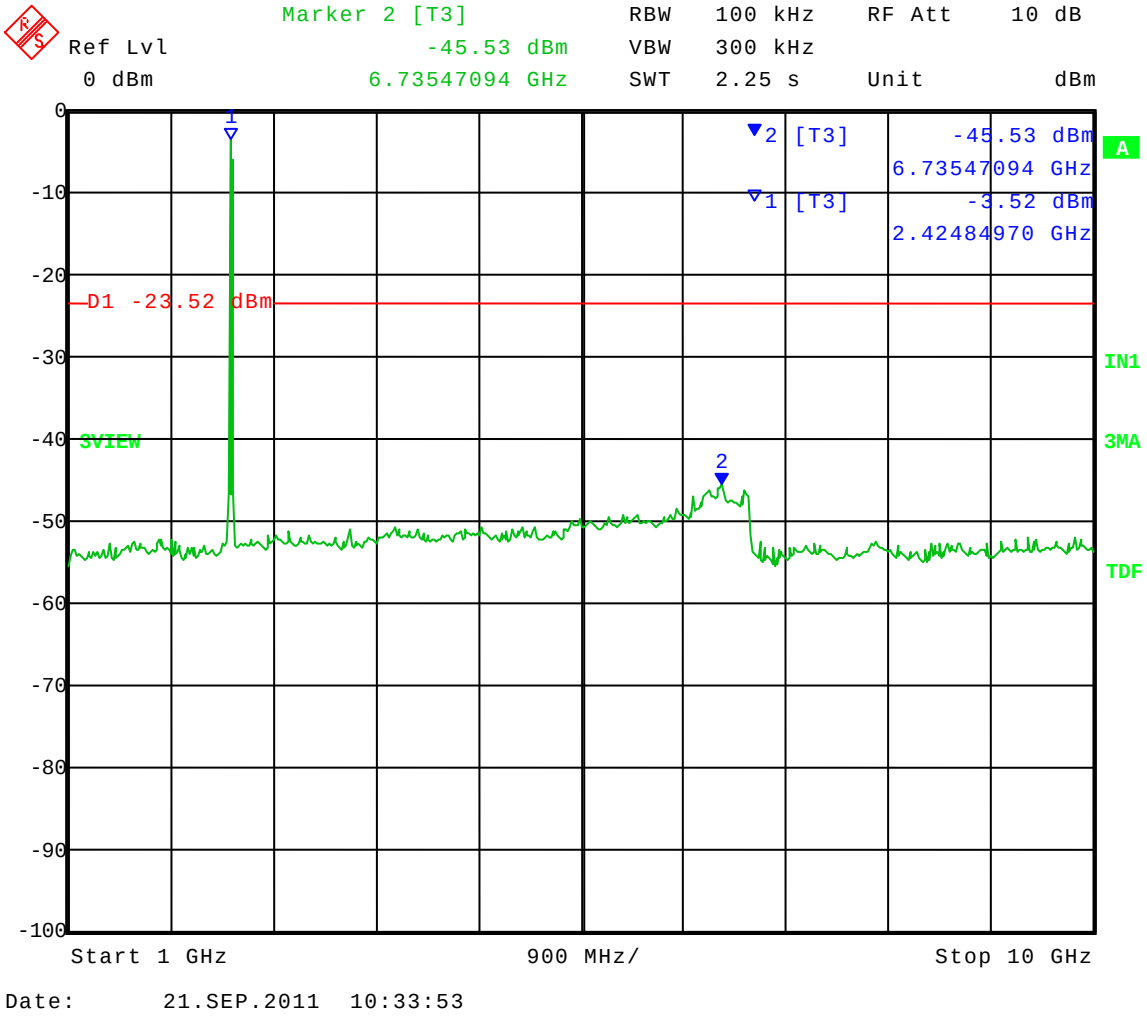
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Middle Channel Transmit = 2.437 GHz
802.11g

Frequency Range: 1 to 10 GHz
Limit = -23.52 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



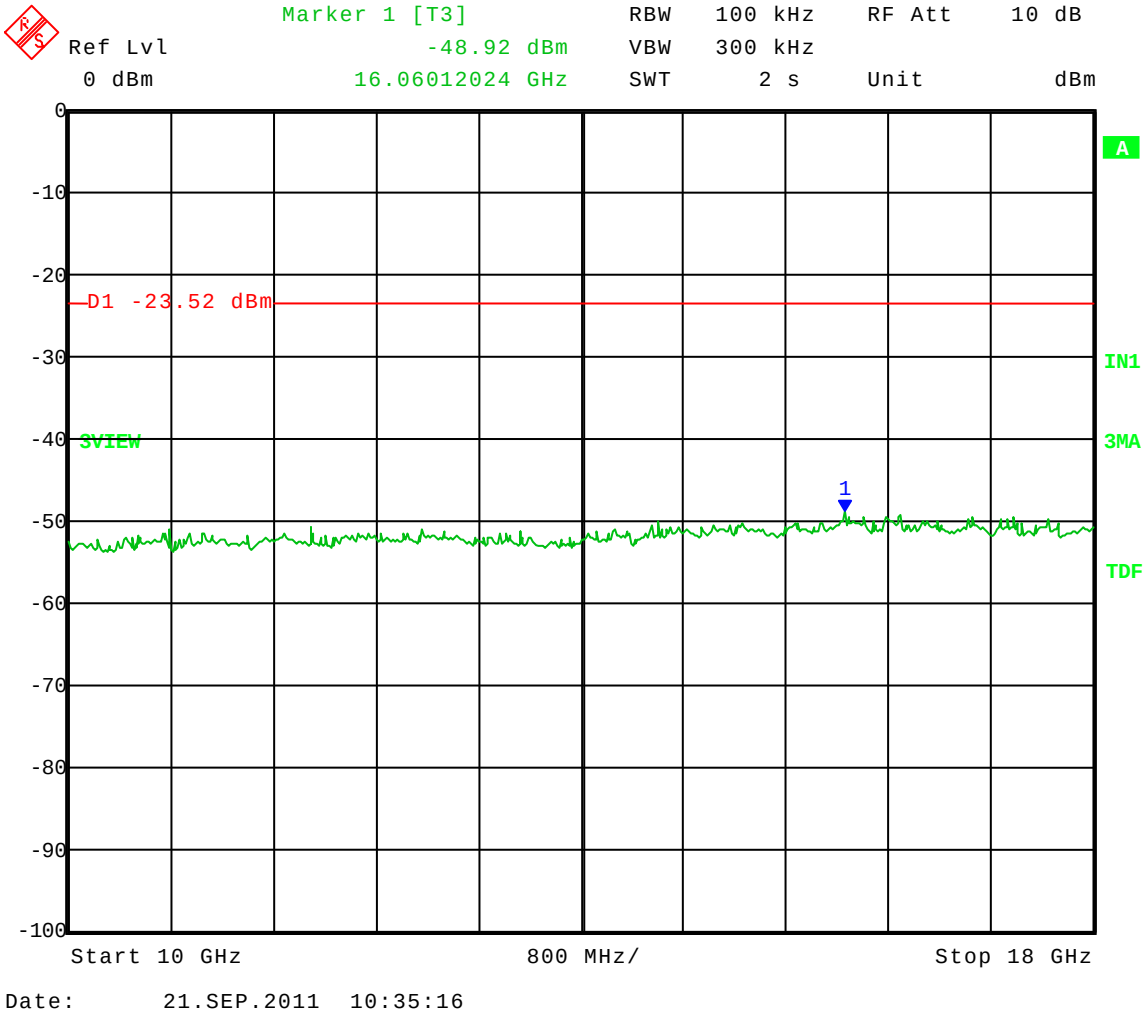
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Middle Channel Transmit = 2.437 GHz
802.11g

Frequency Range: 10 to 18 GHz
Limit = -23.52 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



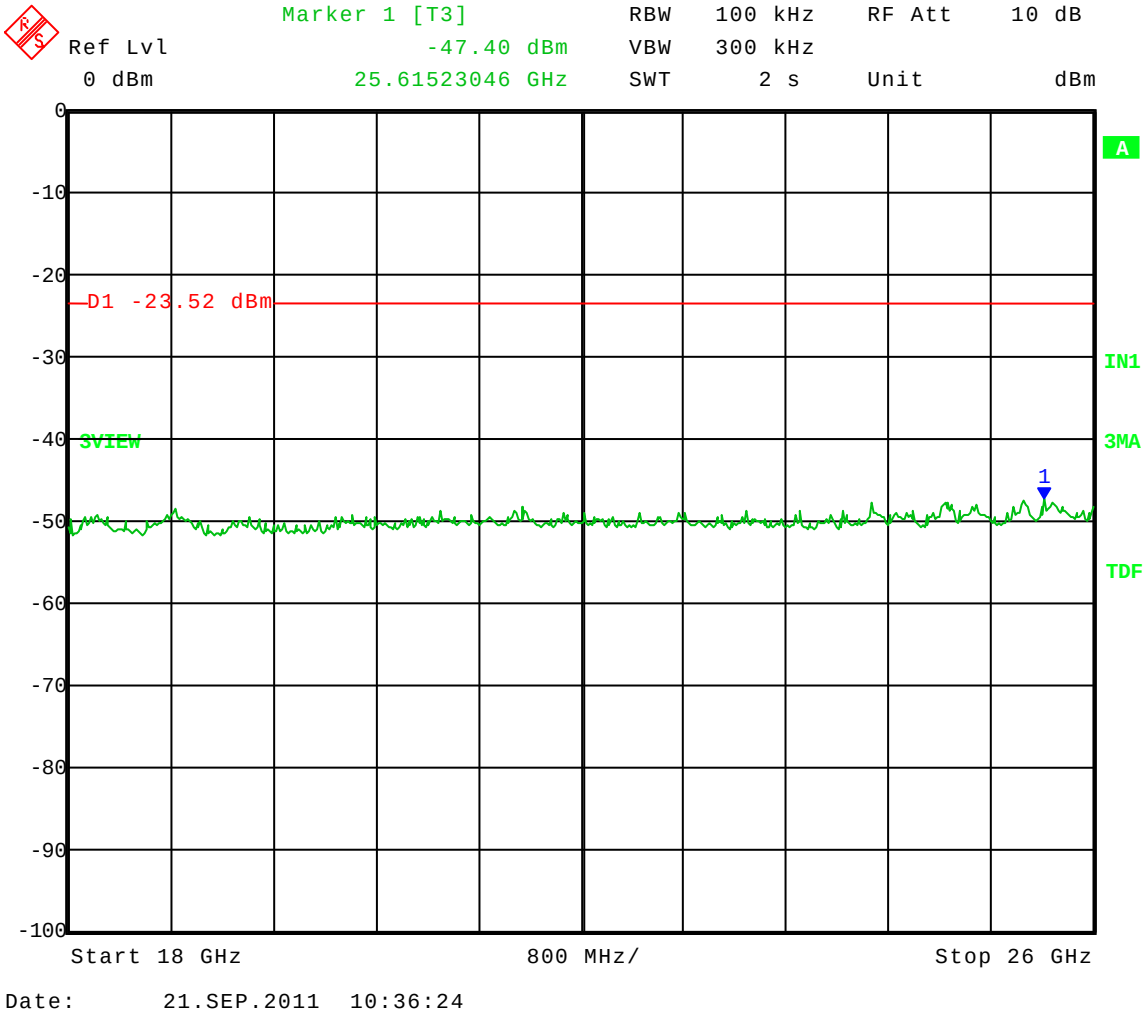
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Middle Channel Transmit = 2.437 GHz
802.11g

Frequency Range: 18 to 26 GHz
Limit = -23.52 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



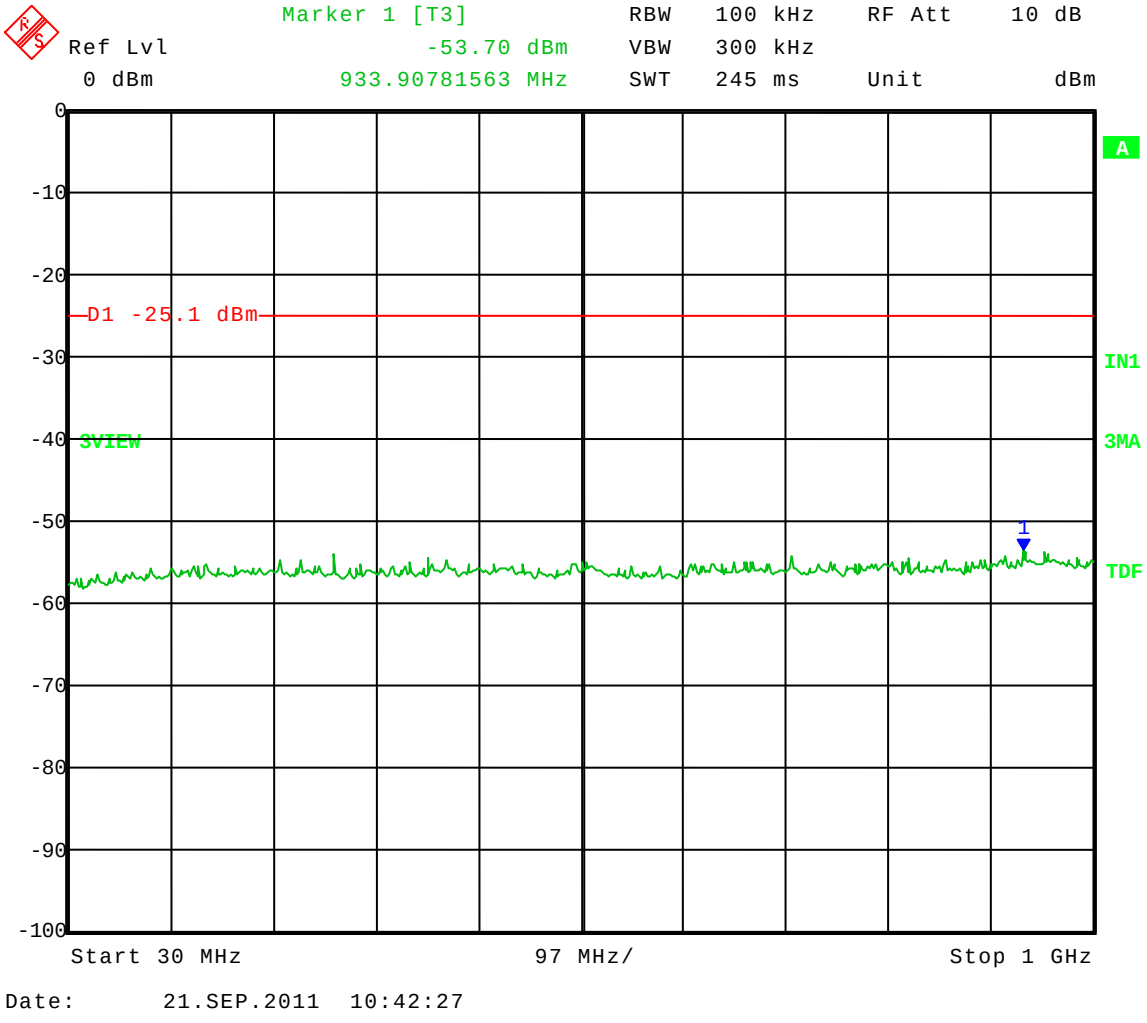
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: High Channel Transmit = 2.462 GHz
802.11g

Frequency Range: 30 to 1000 MHz
Limit = -25.10 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



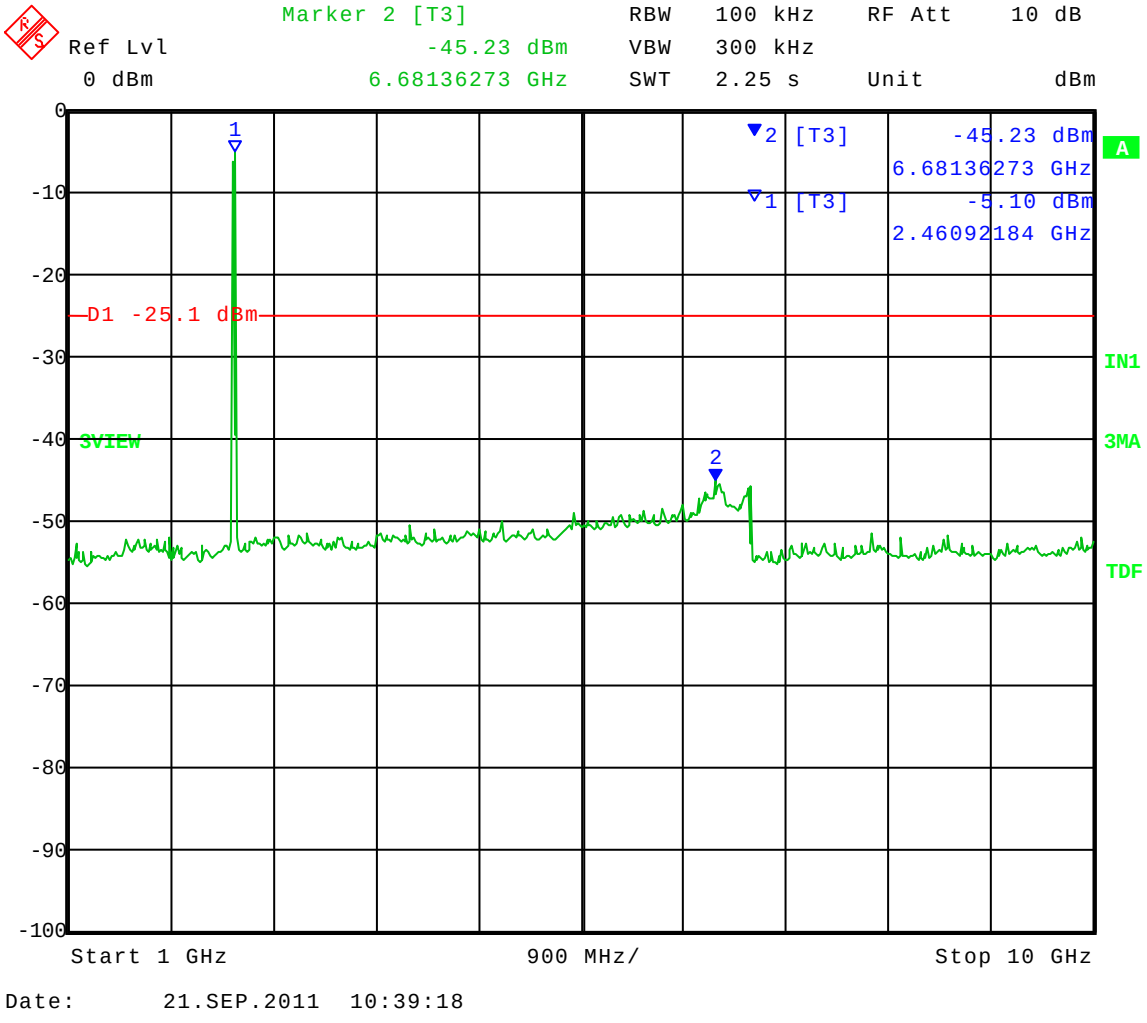
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: High Channel Transmit = 2.462 GHz
802.11g

Frequency Range: 1 to 10 GHz
Limit = -25.10 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



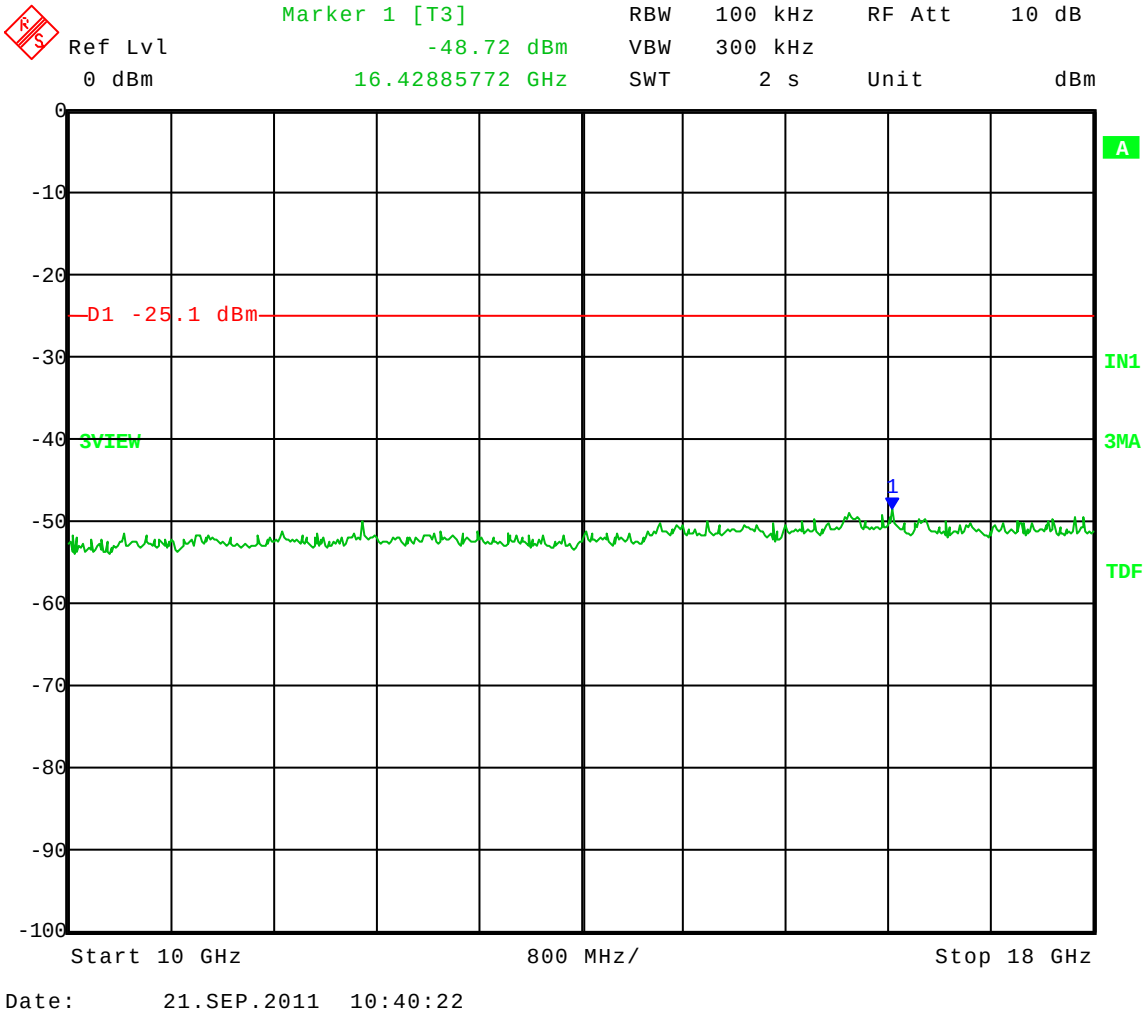
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: High Channel Transmit = 2.462 GHz
802.11g

Frequency Range: 10 to 18 GHz
Limit = -25.10 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



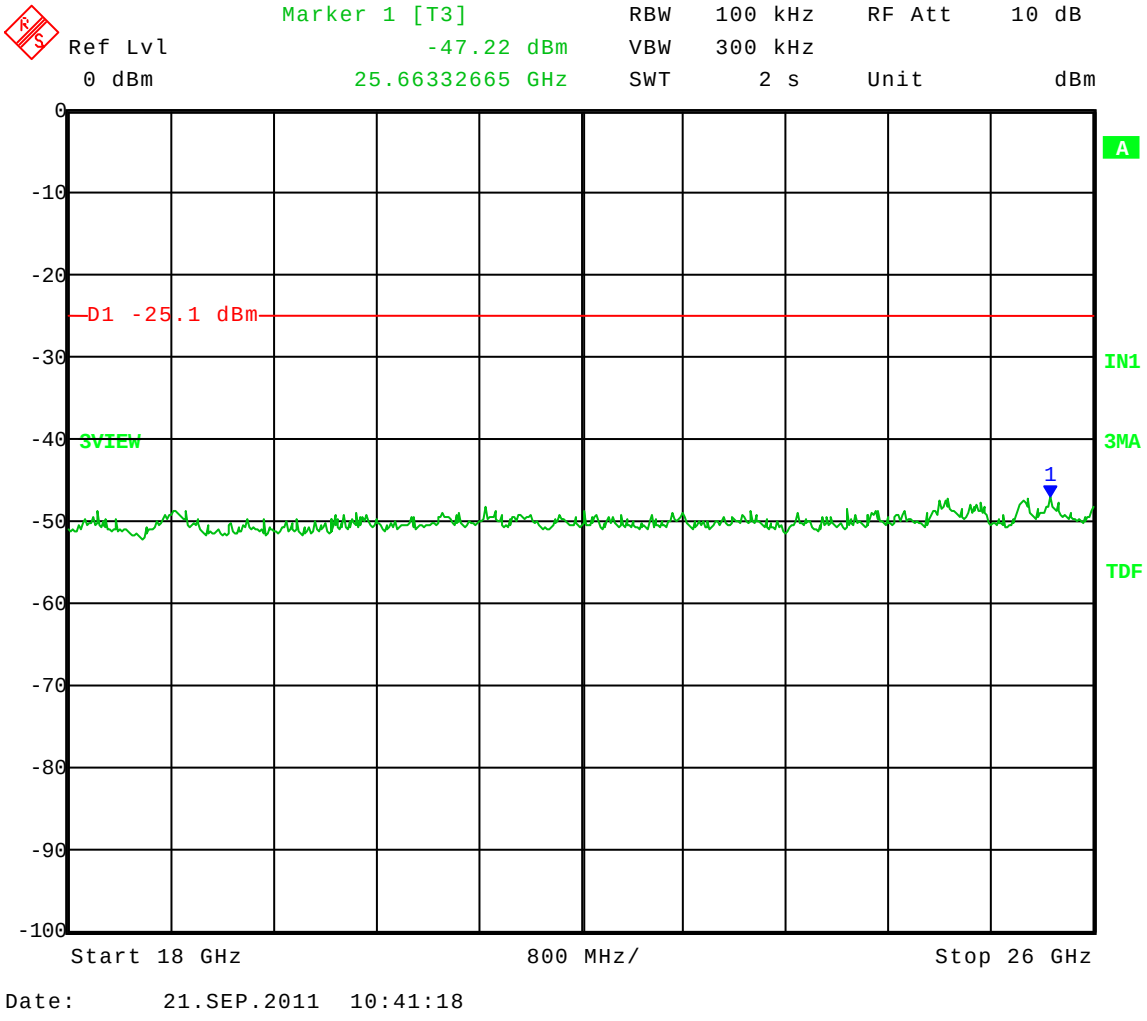
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: High Channel Transmit = 2.462 GHz
802.11g

Frequency Range: 18 to 26 GHz
Limit = -25.10 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Appendix B – Measurement Data

B3.1 RF Conducted Spurious Emissions – 802.11b mode

Rule Part: FCC Part 15.247(d)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. (Device complies with Power Option 1).

Results: Compliant

Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle. A peak detector was used for this test.

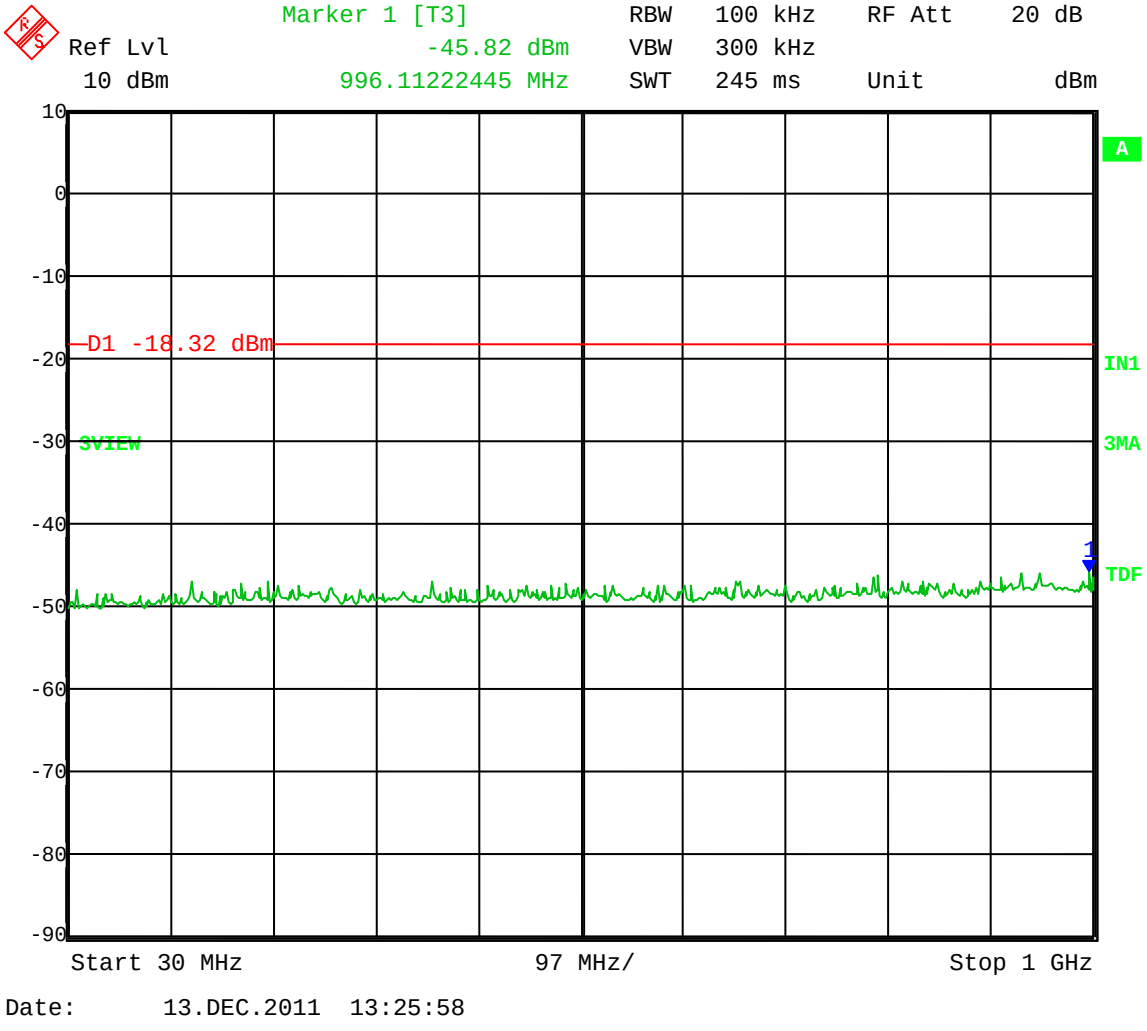
Appendix B – Measurement Data

Test Date: 12-13-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Low Channel Transmit = 2.412 GHz
802.11b

Frequency Range: 30 to 1000 MHz
Limit = -18.32 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



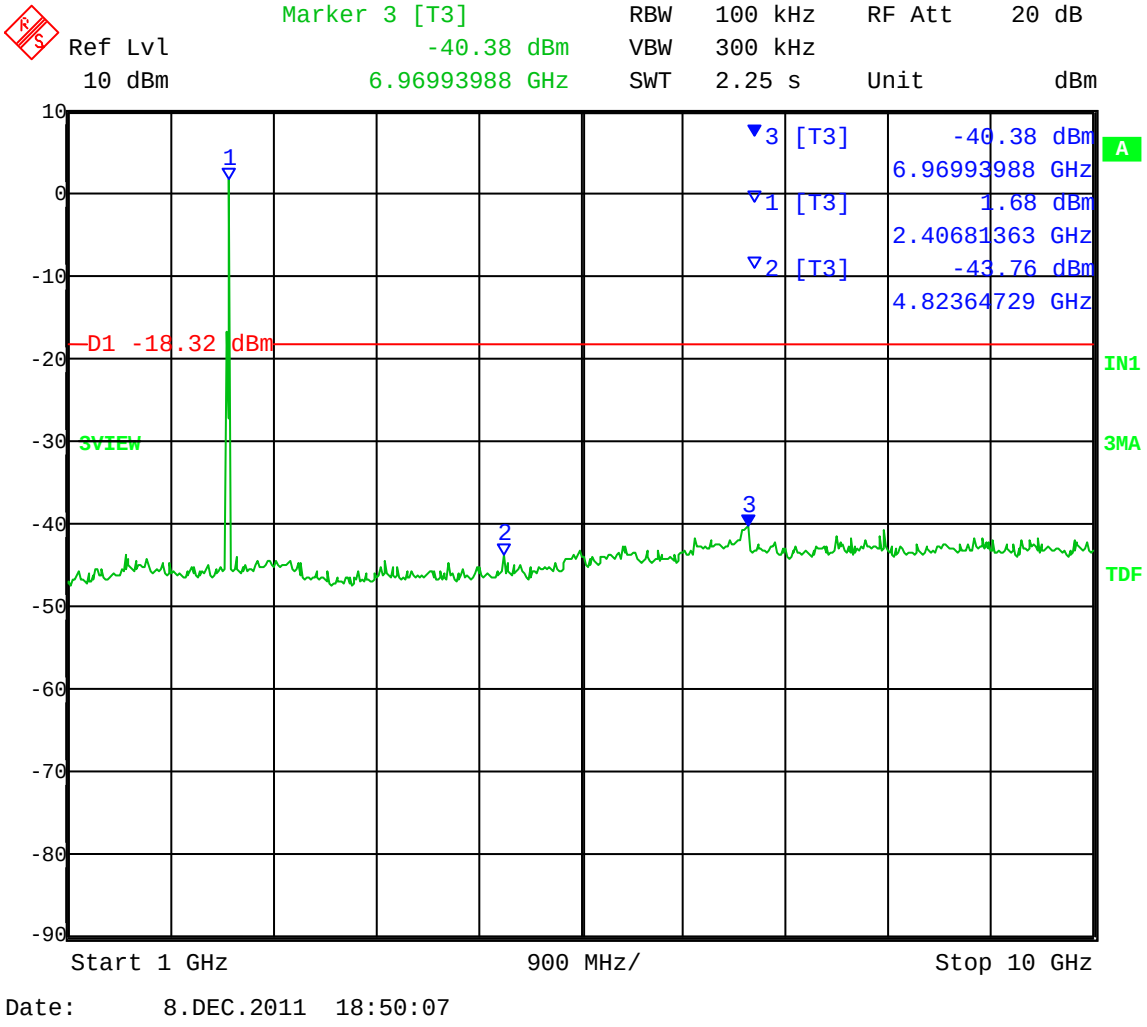
Appendix B – Measurement Data

Test Date: 12-08-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Low Channel Transmit = 2.412 GHz
802.11b

Frequency Range: 1 to 10 GHz
Limit = -18.32 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



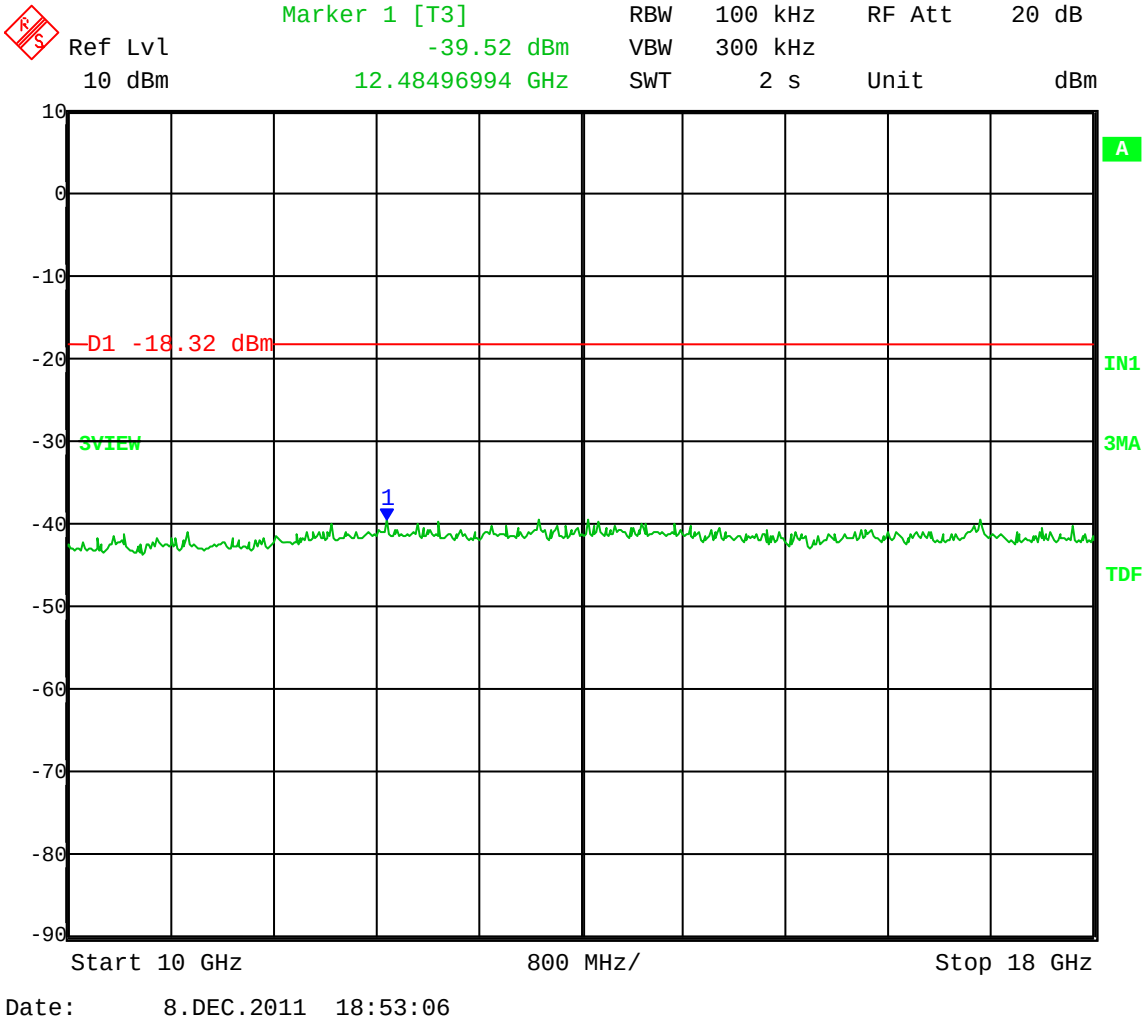
Appendix B – Measurement Data

Test Date: 12-08-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Low Channel Transmit = 2.412 GHz
802.11b

Frequency Range: 10 to 18 GHz
Limit = -18.32 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



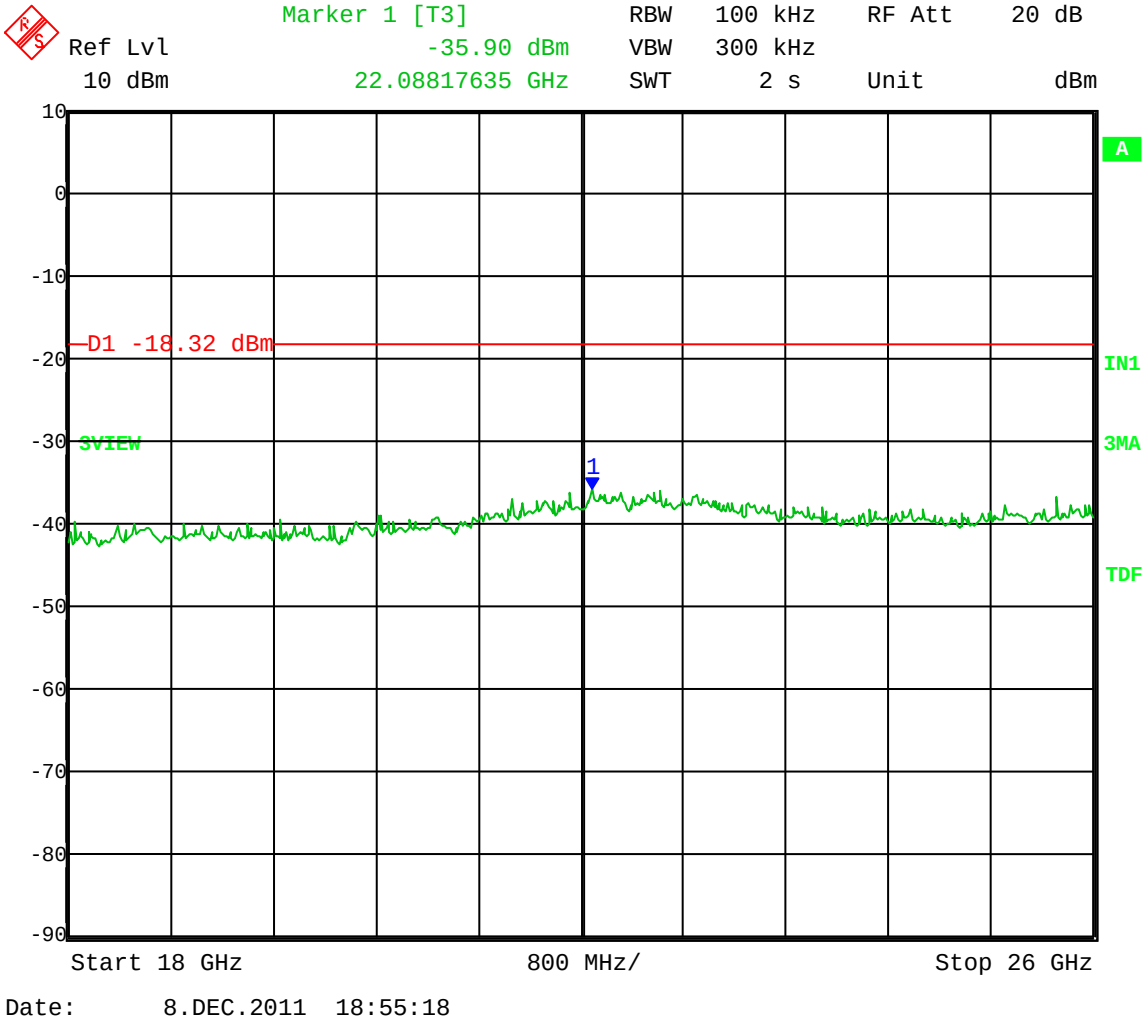
Appendix B – Measurement Data

Test Date: 12-08-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Low Channel Transmit = 2.412 GHz
802.11b

Frequency Range: 18 to 26 GHz
Limit = -18.32 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



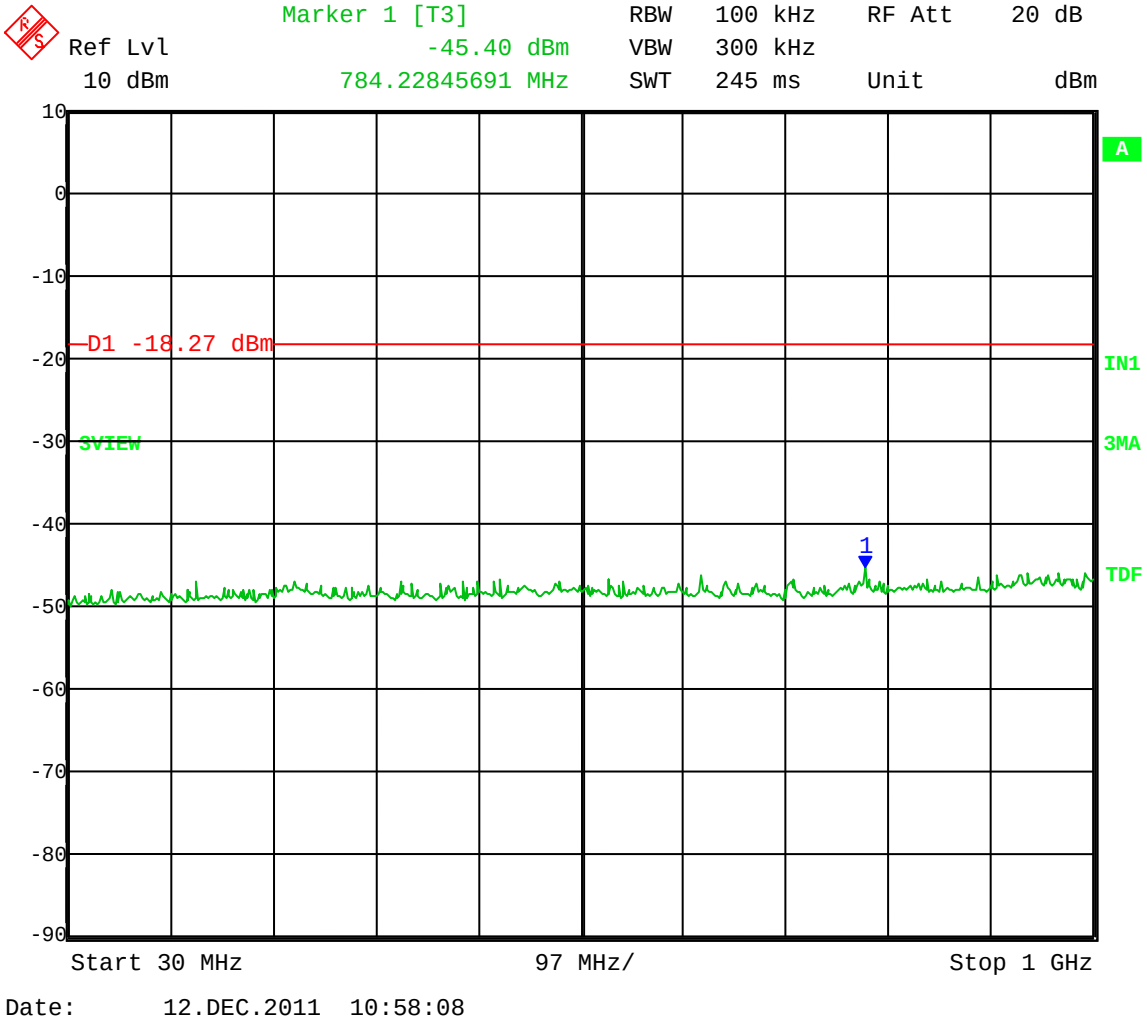
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Middle Channel Transmit = 2.437 GHz
802.11b

Frequency Range: 30 to 1000 MHz
Limit = -18.27 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



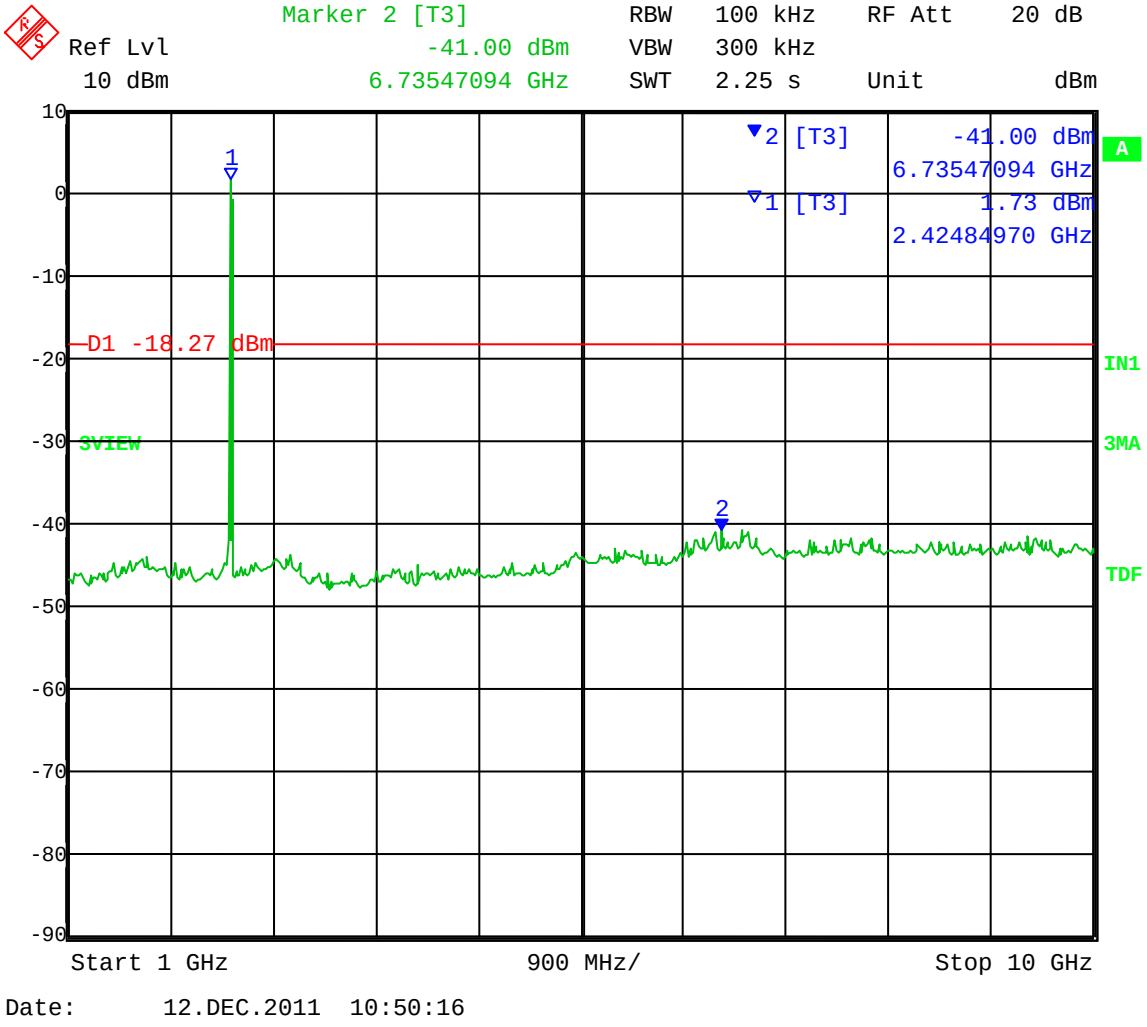
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Middle Channel Transmit = 2.437 GHz
802.11b

Frequency Range: 1 to 10 GHz
Limit = -18.27 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



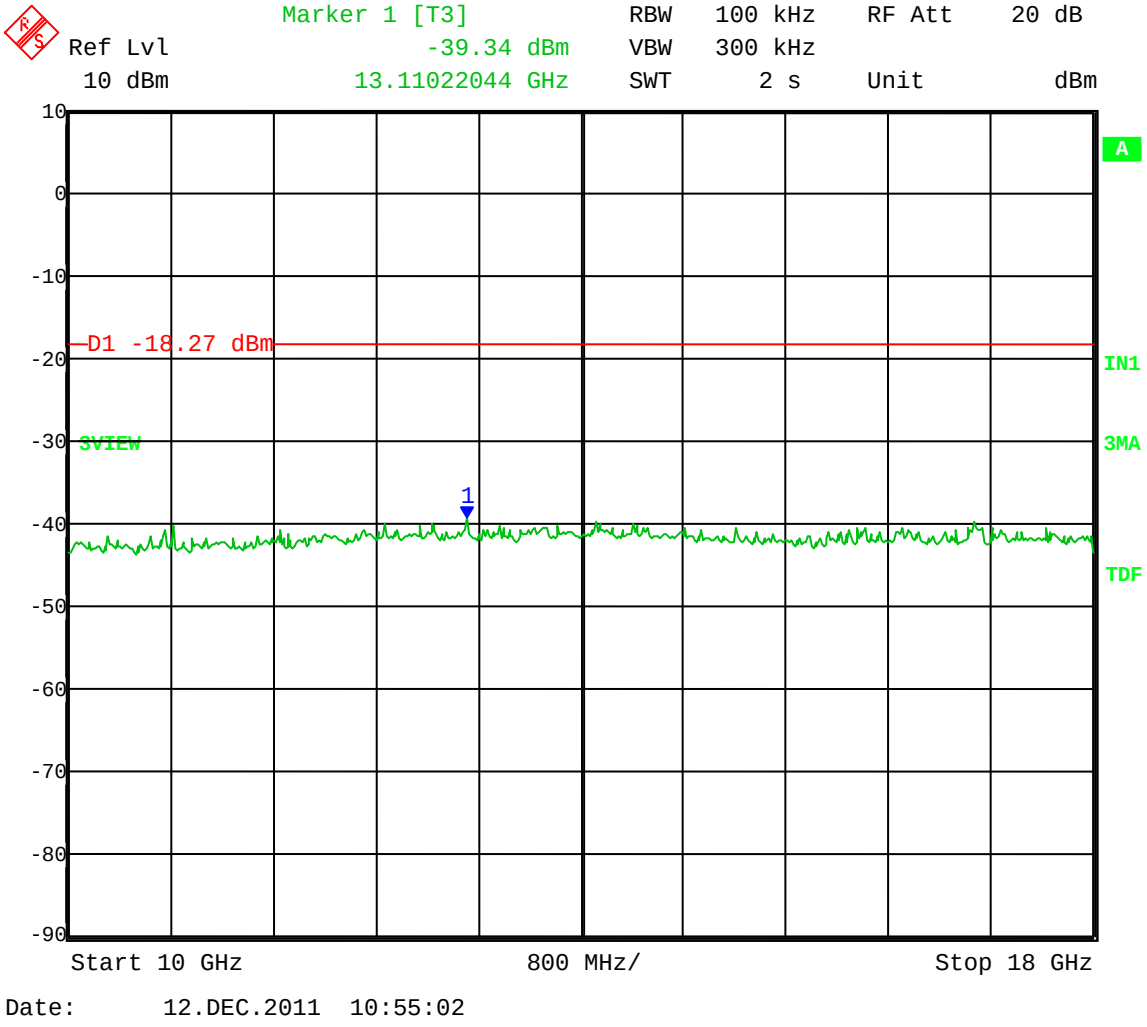
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Middle Channel Transmit = 2.437 GHz
802.11b

Frequency Range: 10 to 18 GHz
Limit = -18.27 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



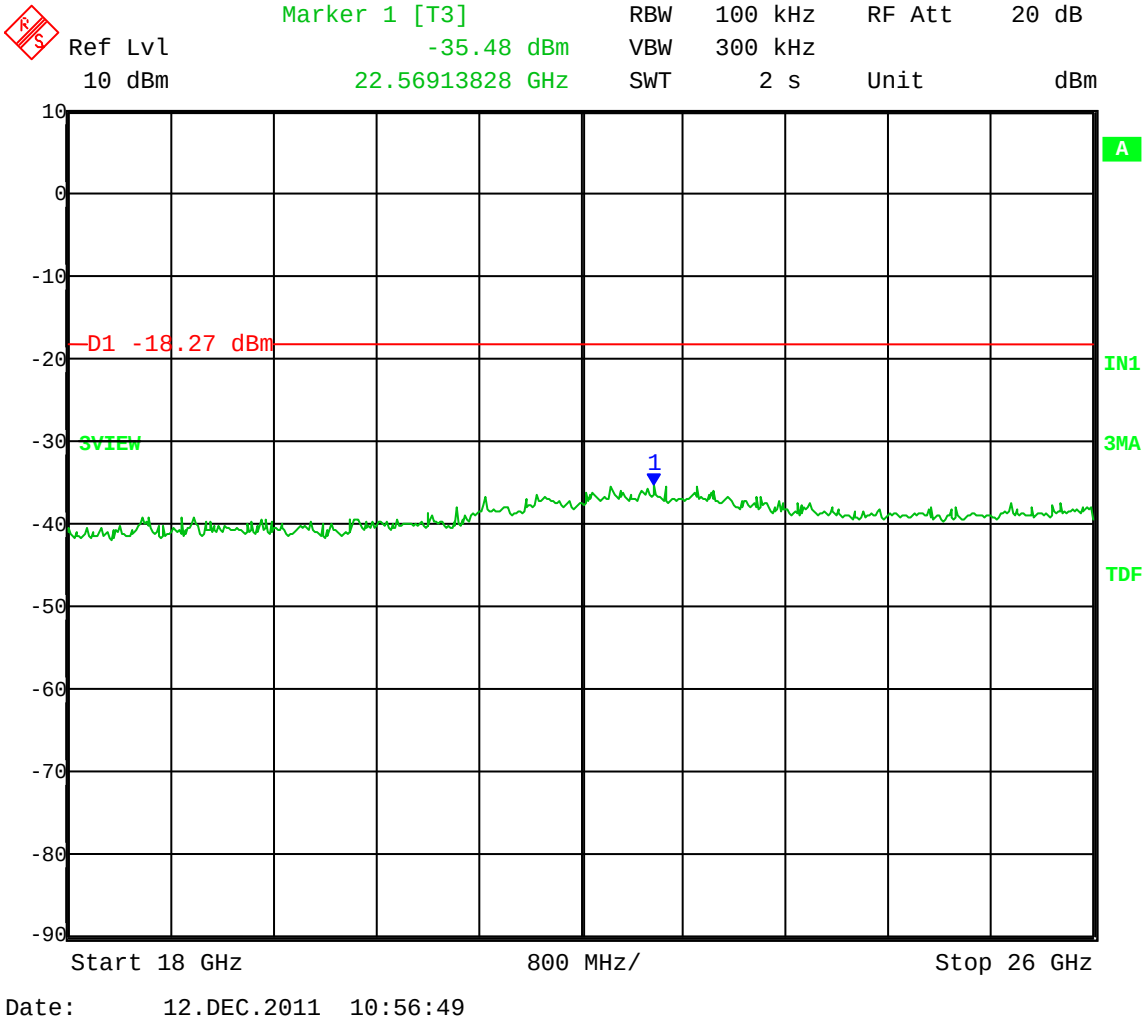
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: Middle Channel Transmit = 2.437 GHz
802.11b

Frequency Range: 18 to 26 GHz
Limit = -18.27 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



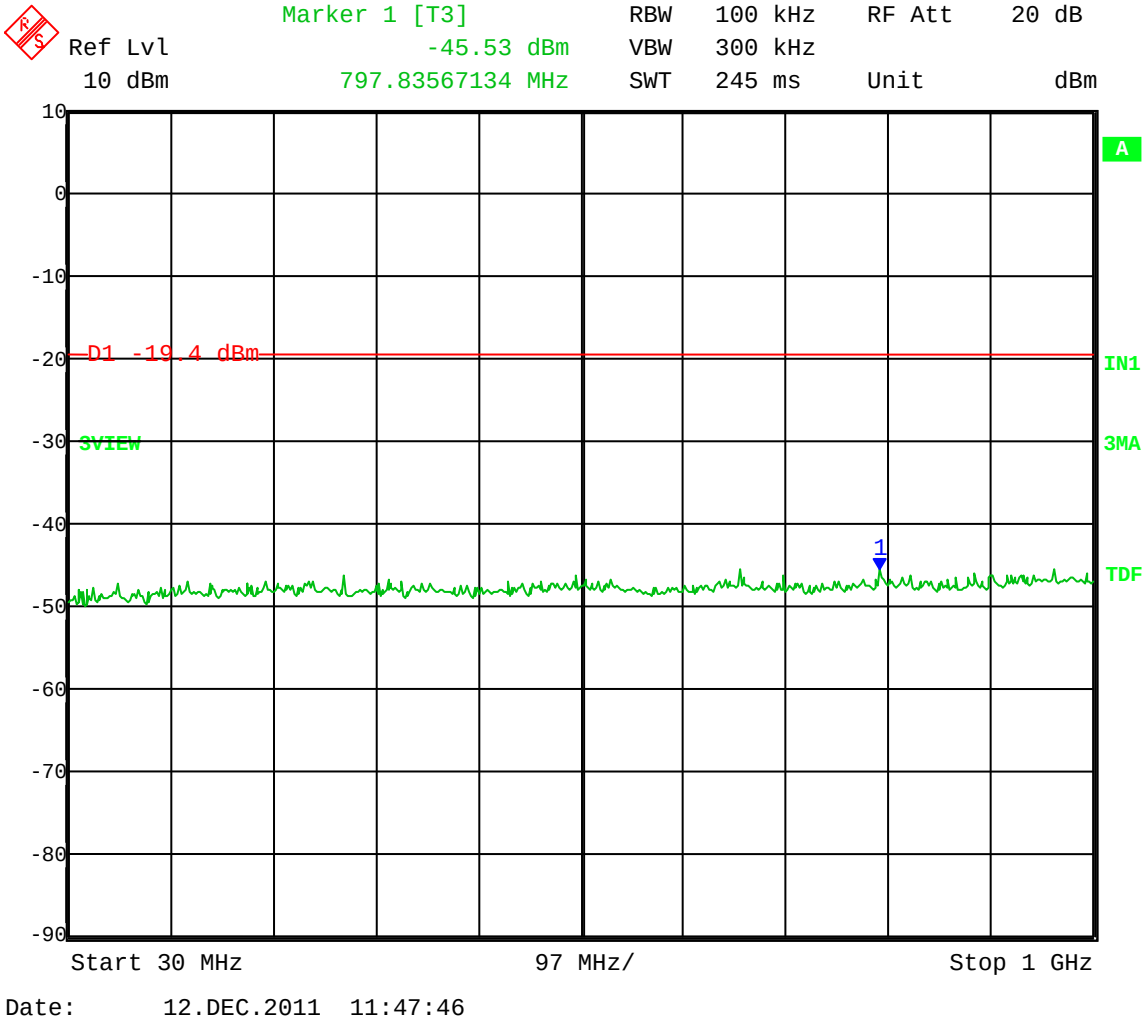
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: High Channel Transmit = 2.462 GHz
802.11b

Frequency Range: 30 to 1000 MHz
Limit = -19.40 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



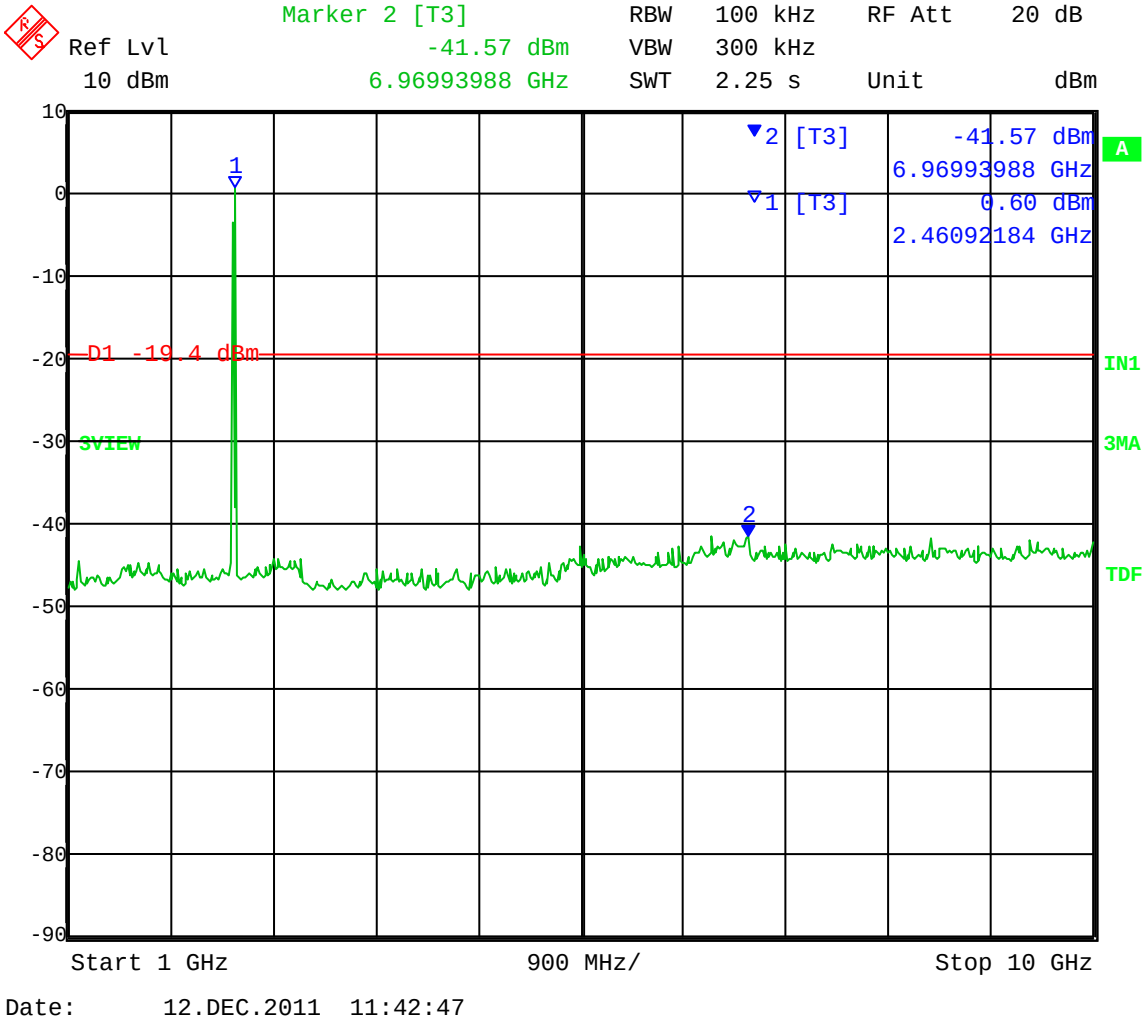
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: High Channel Transmit = 2.462 GHz
802.11b

Frequency Range: 1 to 10 GHz
Limit = -19.40 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



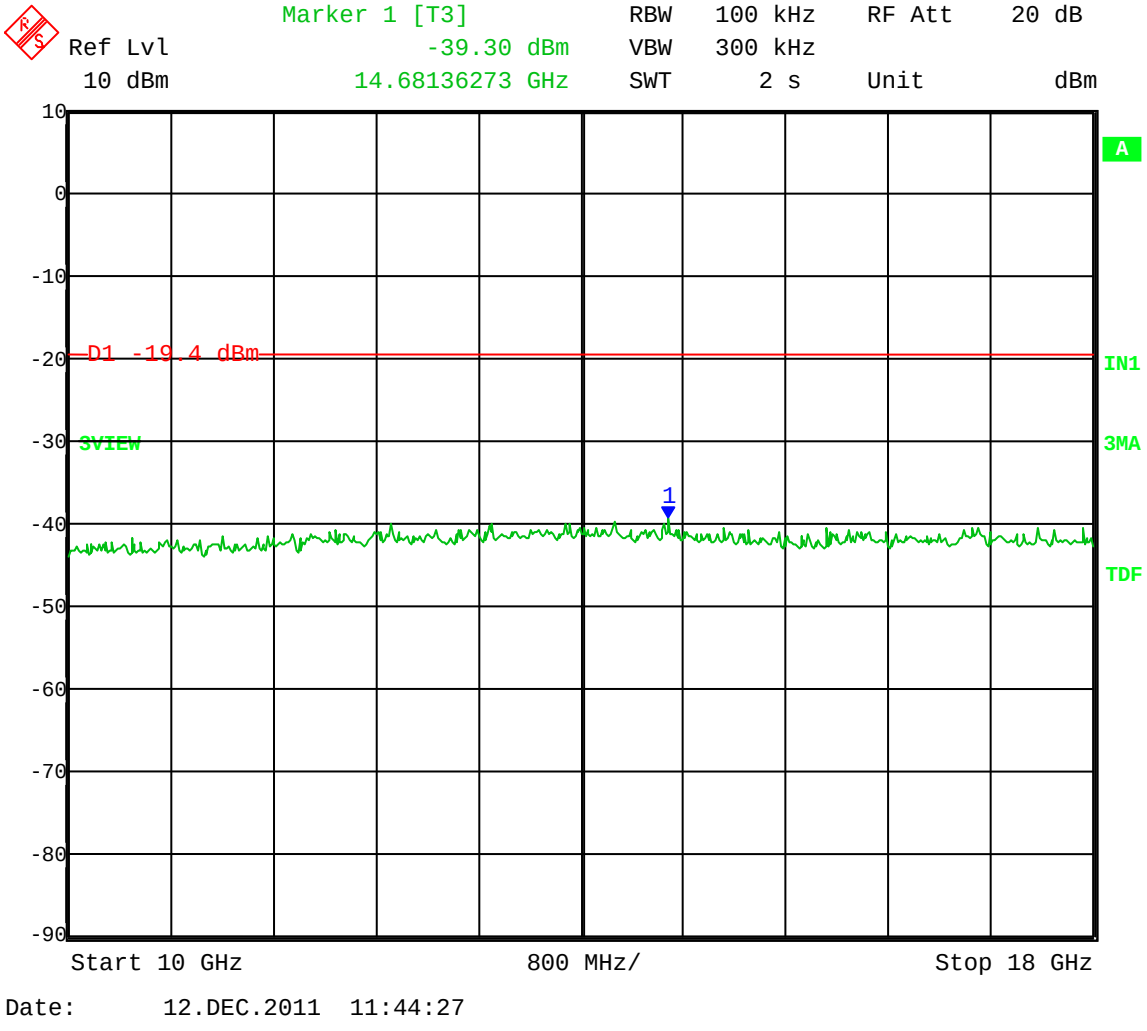
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: High Channel Transmit = 2.462 GHz
802.11b

Frequency Range: 10 to 18 GHz
Limit = -19.40 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



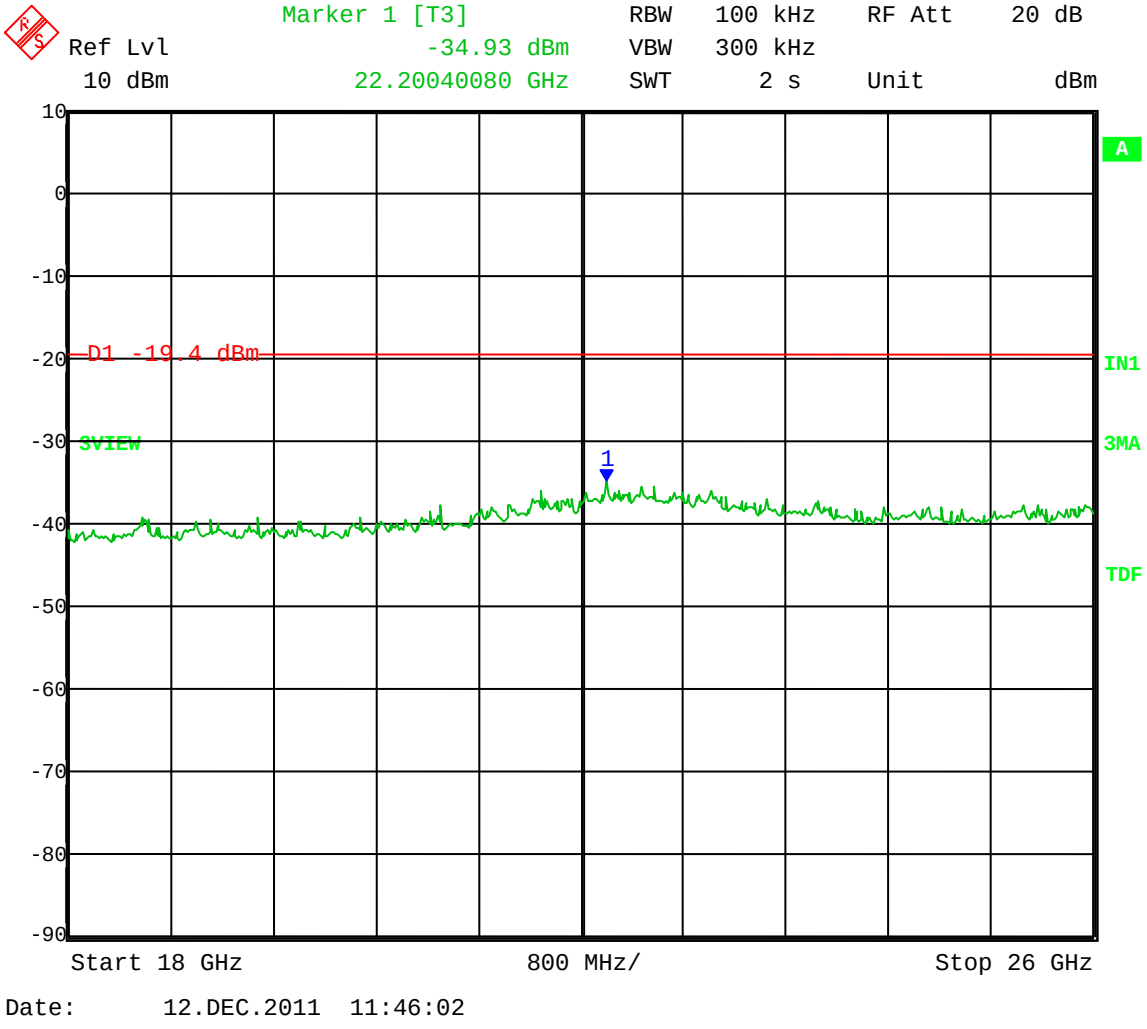
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Spurious Emissions - Conducted
Operator: Craig B

Comment: High Channel Transmit = 2.462 GHz
802.11b

Frequency Range: 18 to 26 GHz
Limit = -19.40 dBm

All Spurious Emissions at Least 20 dB below Peak Level of In Band Frequency



Appendix B – Measurement Data

B4.0 Band Edge Emission – 802.11g mode

Rule Part: FCC Part 15.247(d)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. (Device complies with Power Option 1).

Results: Compliant

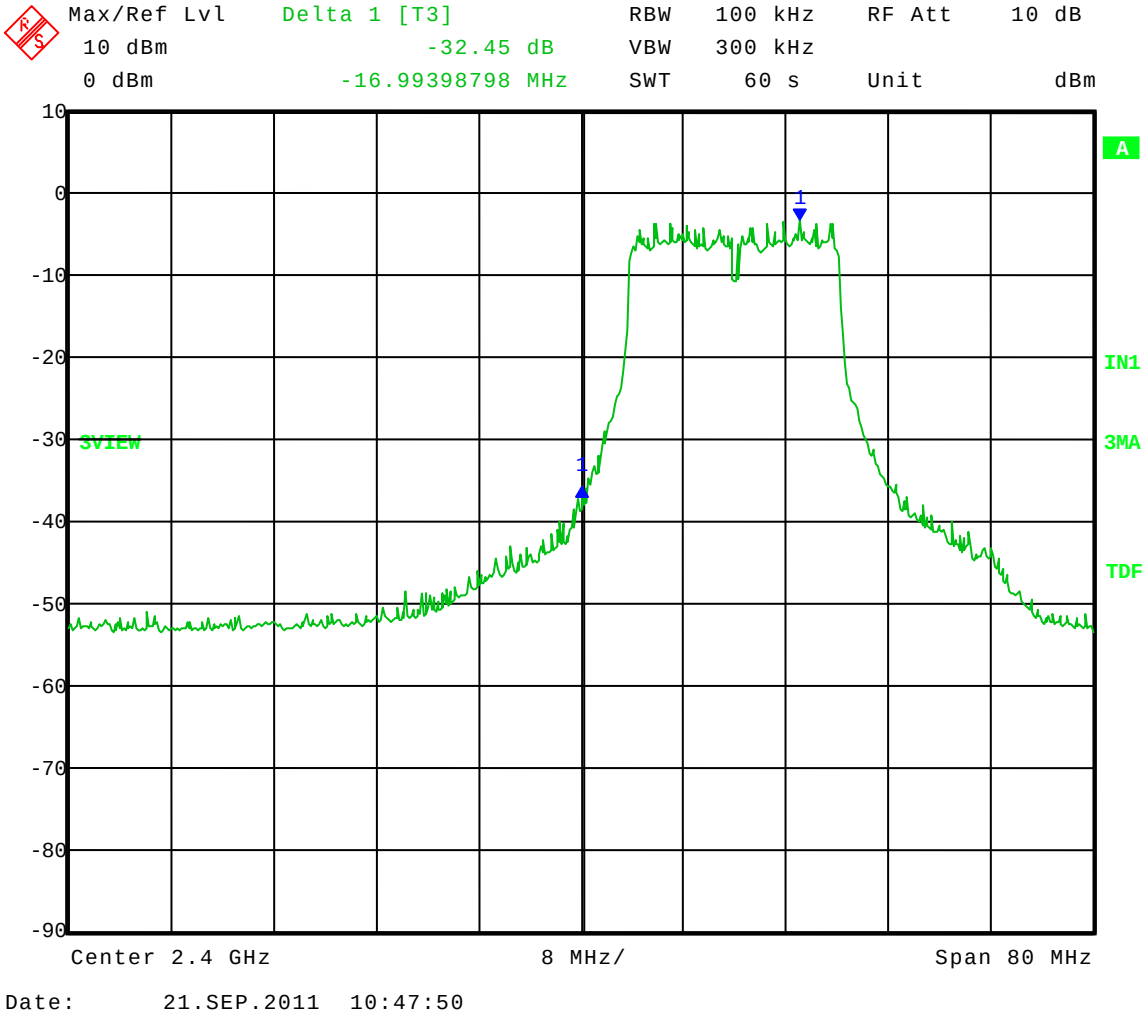
Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle.

Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Low Band-Edge Compliance - Conducted
Operator: Craig B

Comment: Low Channel: Frequency – 2.412 GHz
802.11g

Band-Edge Frequency = 2.4 GHz
Band-Edge > 20 dB Below Peak In-Band Emission

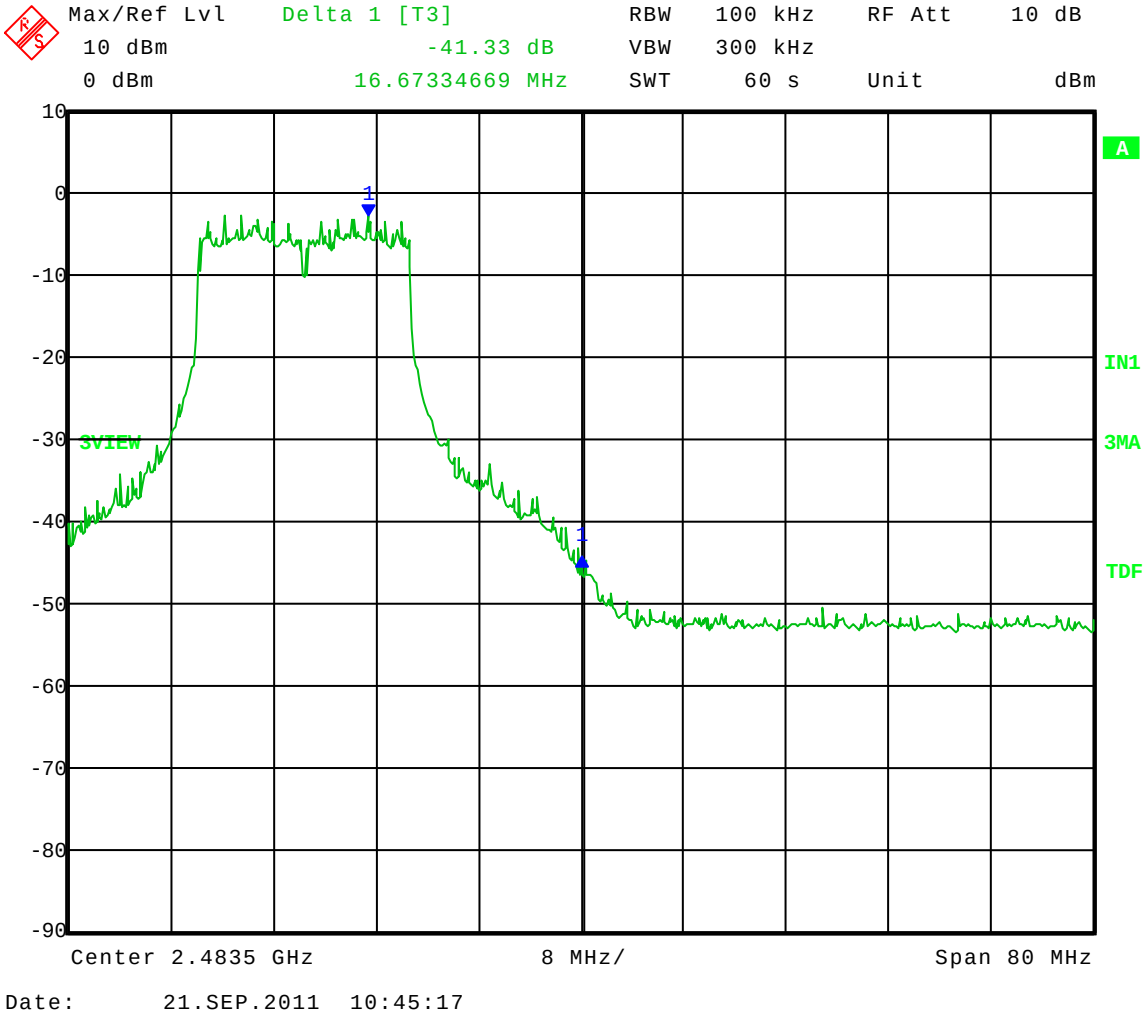


Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Upper Band-Edge Compliance - Conducted
Operator: Craig B

Comment: High Channel: Frequency – 2.462 GHz
802.11g

Band-Edge Frequency = 2.4835 GHz
Band-Edge > 20 dB Below Peak In-Band Emission



Appendix B – Measurement Data

B4.1 Band Edge Emission – 802.11b mode

Rule Part: FCC Part 15.247(d)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. (Device complies with Power Option 1).

Results: Compliant

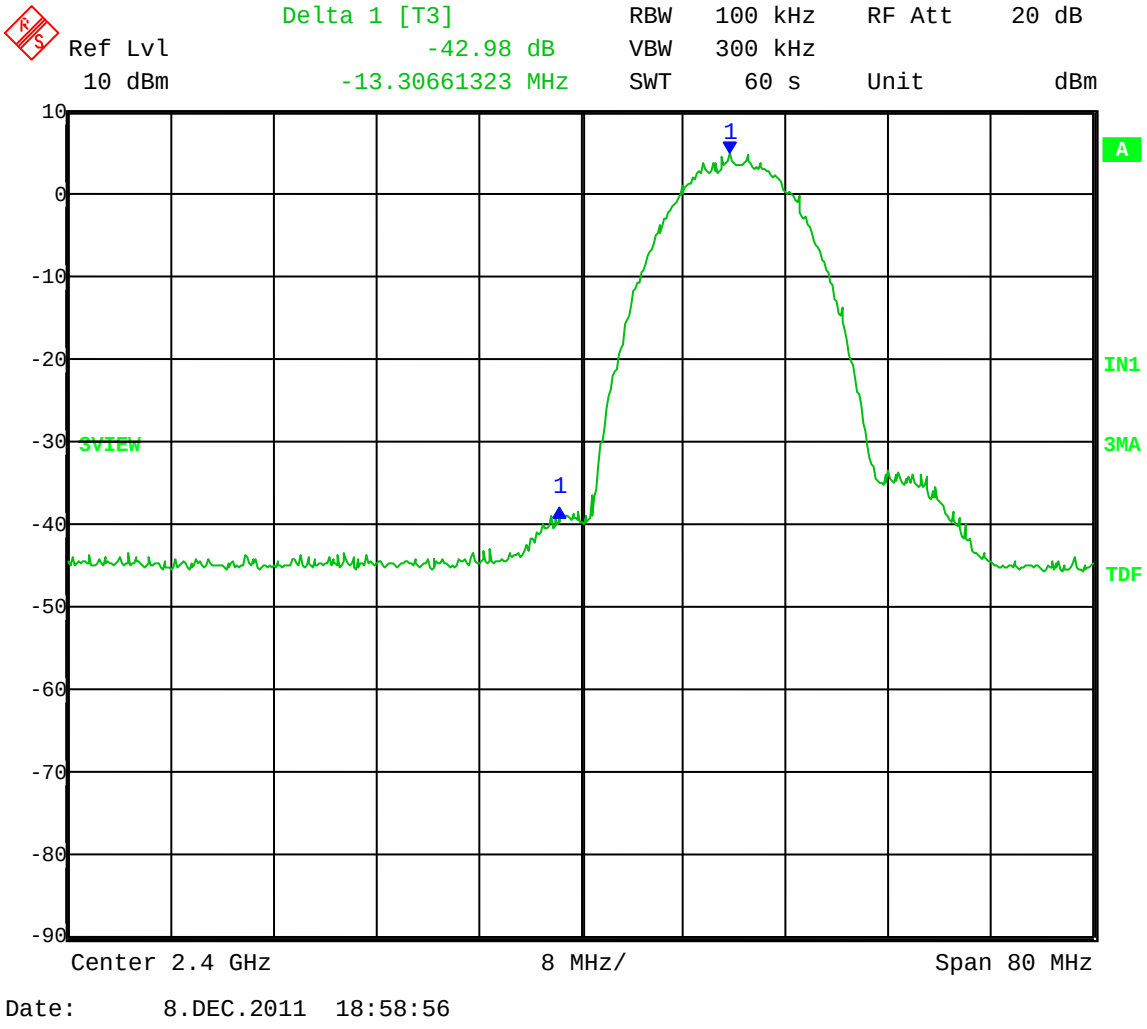
Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle.

Appendix B – Measurement Data

Test Date: 12-08-2011
Company: Koss Corporation
EUT: CC4.5
Test: Low Band-Edge Compliance - Conducted
Operator: Craig B

Comment: Low Channel: Frequency – 2.412 GHz
802.11b

Band-Edge Frequency = 2.4 GHz
Band-Edge > 20 dB Below Peak In-Band Emission

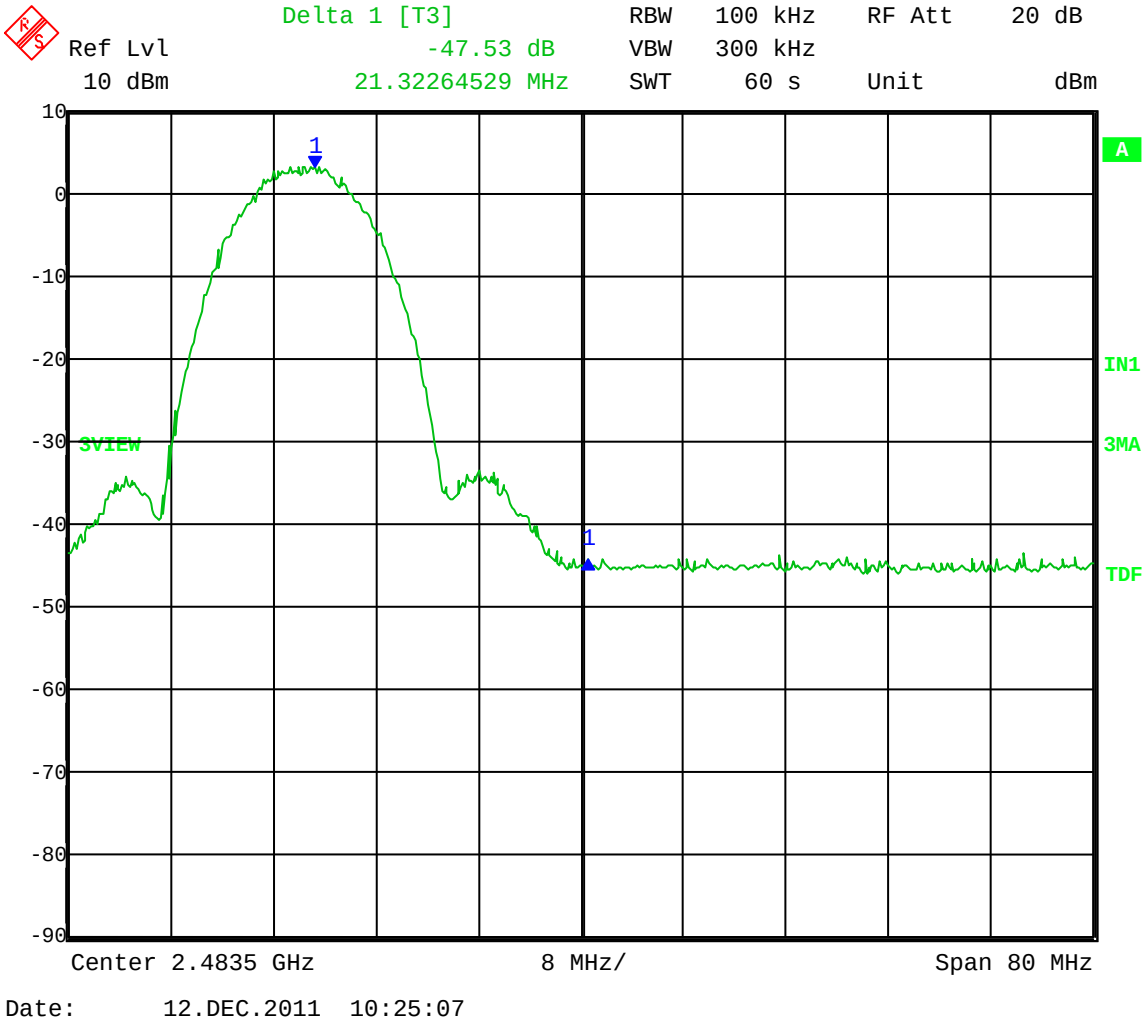


Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Upper Band-Edge Compliance - Conducted
Operator: Craig B

Comment: High Channel: Frequency – 2.462 GHz
802.11b

Band-Edge Frequency = 2.4835 GHz
Band-Edge > 20 dB Below Peak In-Band Emission



Appendix B – Measurement Data

B4.2 Radiated Upper Band Edge Emission

Rule Part: FCC Part 15.247(d) and FCC Part 15.205

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005), FCC Publication KDB 558074

Limit: FCC Part 15.209

Results: Compliant

Notes: The upper band-edge coincides with a restricted band. Compliance was determined by measuring the field strength of the upper channel emission at the band edge.

The EUT was set to transmit at its maximum power and maximum data rate. Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz. Since the EUT is not able to transmit continuously, compliance with the Average limits are shown by applying a duty cycle correction factor to a peak detector measurement.

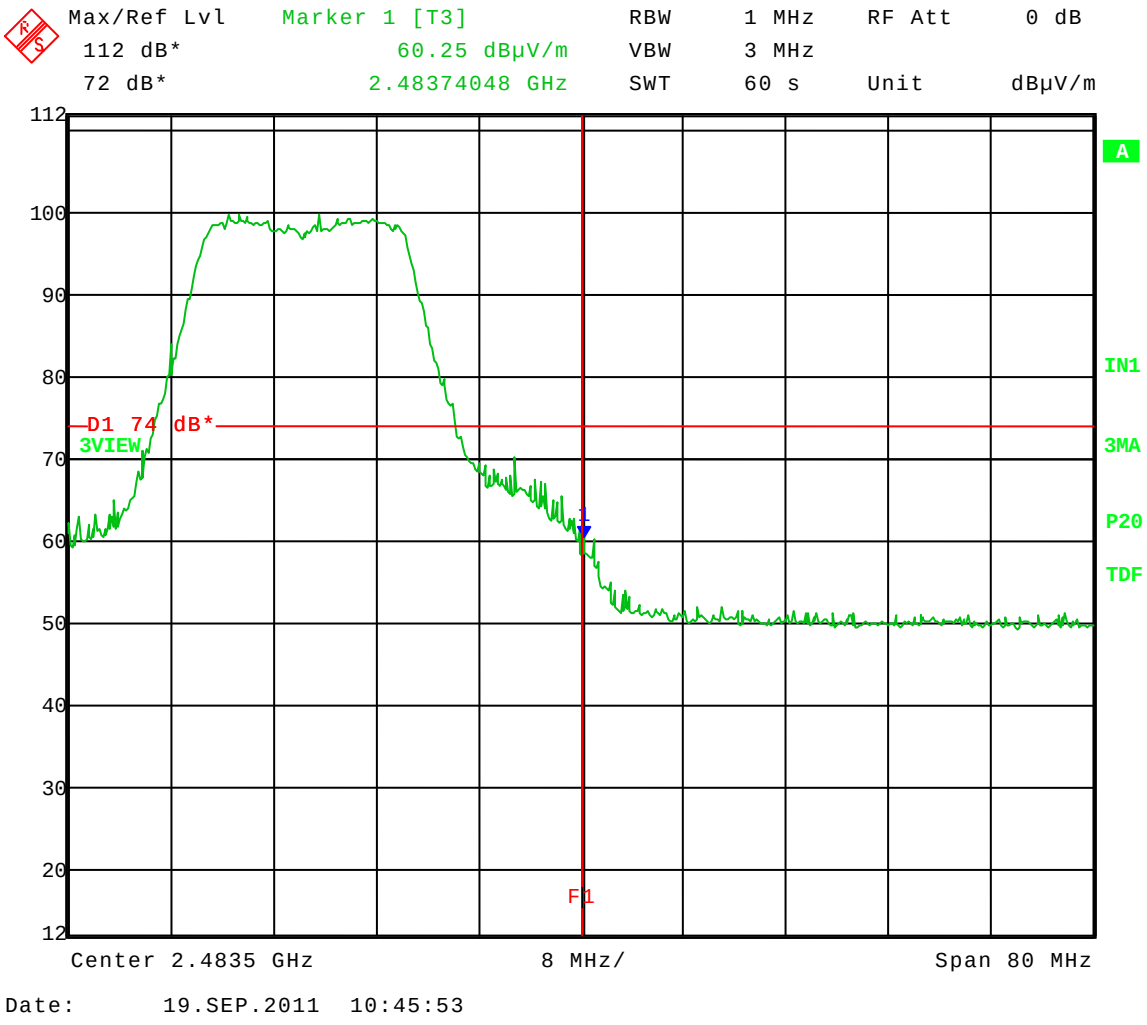
Tested 802.11g mode (worst-case).

Appendix B – Measurement Data

Test Date: 09-19-2011
Company: Koss Corporation
EUT: CC4.5
Test: Upper Band-Edge Radiated
Operator: Craig B
Comment: High Channel: Frequency – 2.462 GHz Vertical (worst-case)
Band-Edge frequency: 2.4835 GHz
Peak limit at band edge: 74 dBµV\m at 3 meters.
Average limit at band edge: 54 dBµV/m at 3 meters.

Measured **Peak** level: 60.25 dBµV/m **Margin: 13.75 dB**

Average level: Peak – duty cycle correction factor = 60.25 – 22.2 = 38.05 dBµV/m **Margin: 15.95 dB**



Appendix B – Measurement Data

B5.0 Peak Power Spectral Density – 802.11g mode

Rule Part: FCC Part 15.247(e)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: +8 dBm/3kHz

Results: Compliant

Sample Equations: Sweep time = (SPAN / 3 kHz)
= (1.5 MHz / 3 kHz)
= 500 seconds

Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle. PSD Option 1 was used for this test.

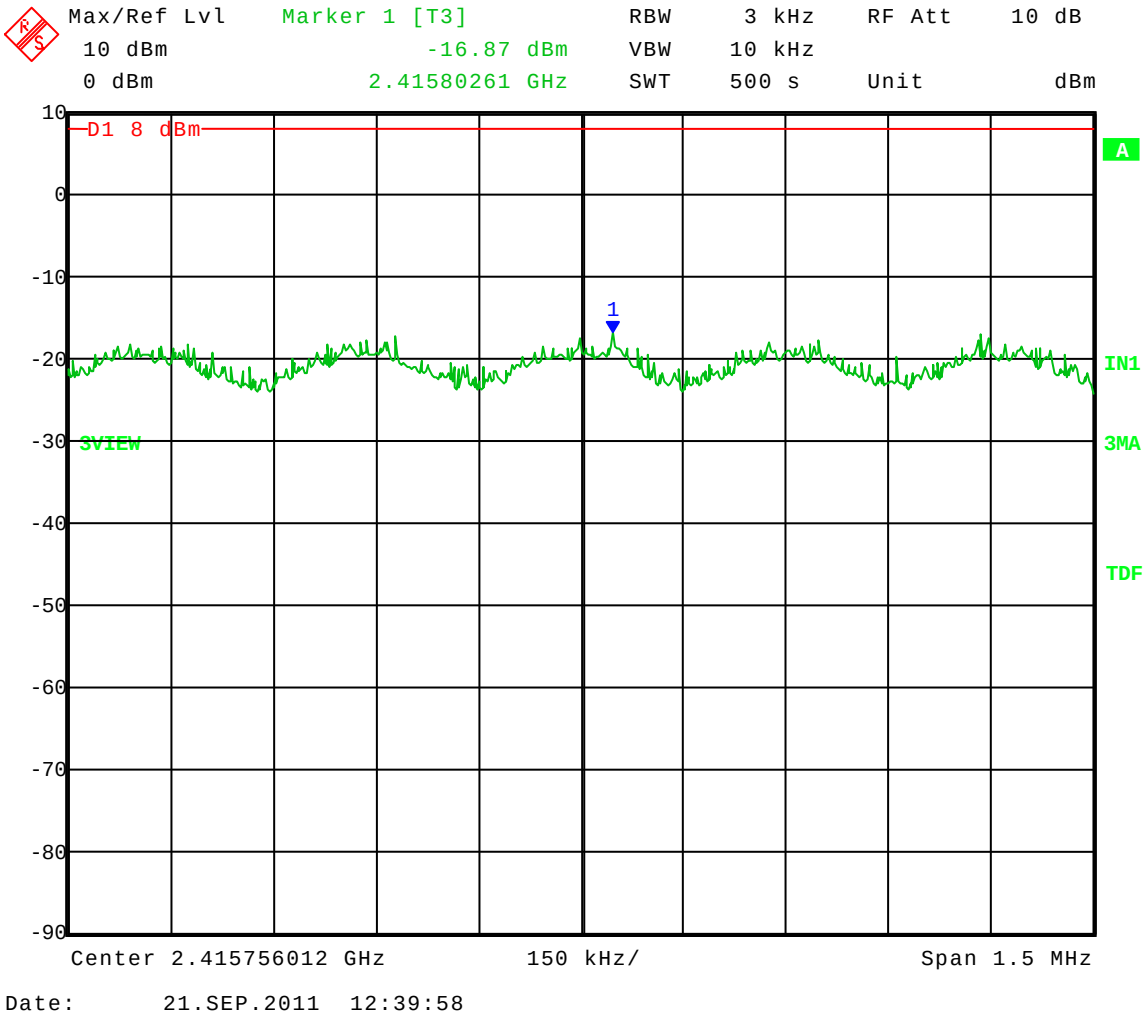
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Peak Power Spectral Density - Conducted
Operator: Craig B

Comment: Low Channel: Frequency – 2.412 GHz
802.11g

Limit: 8 dBm

Power in 3 kHz Bandwidth: **-16.87 dBm**



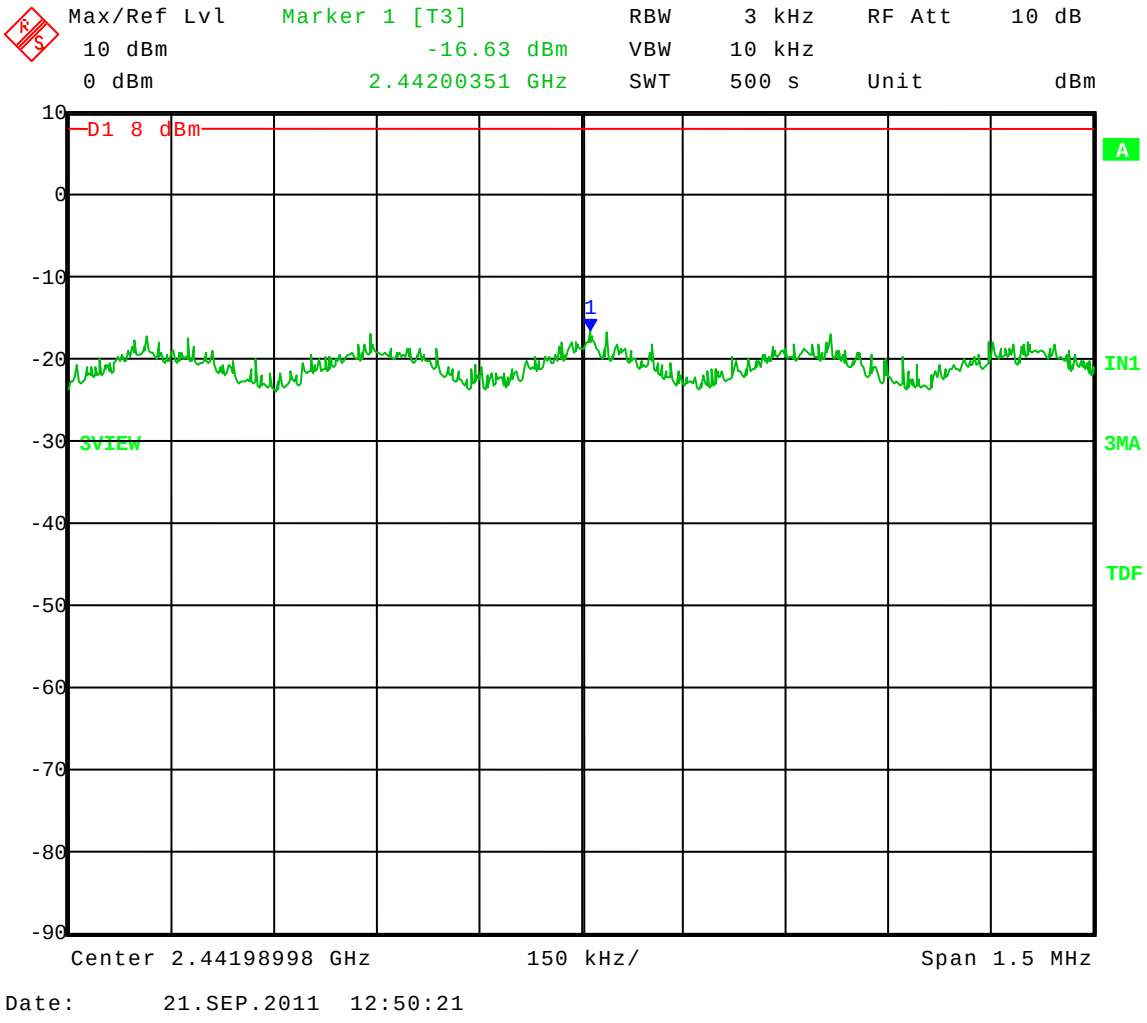
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Peak Power Spectral Density - Conducted
Operator: Craig B

Comment: Middle Channel: Frequency – 2.437 GHz
802.11g

Limit: 8 dBm

Power in 3 kHz Bandwidth: **-16.63 dBm**



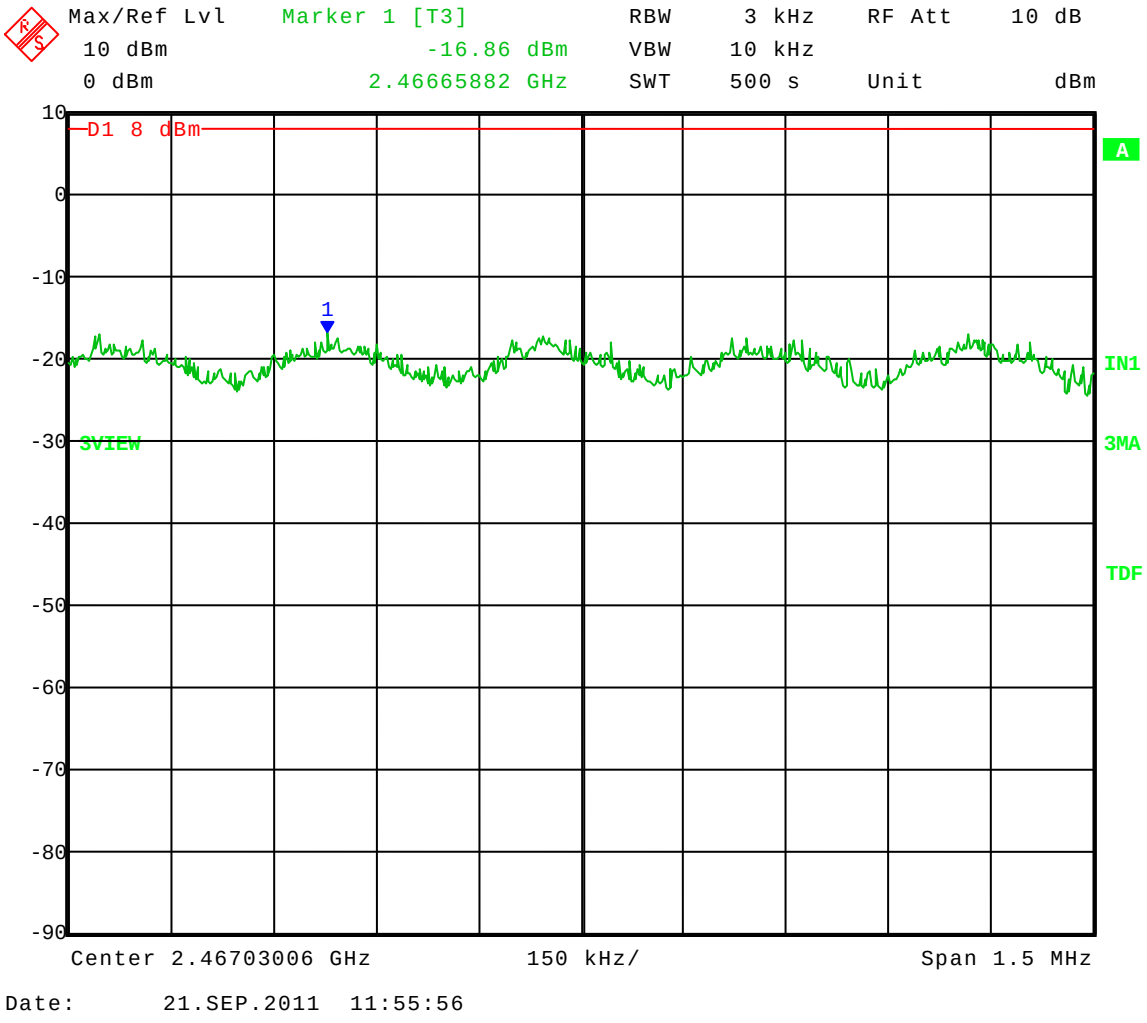
Appendix B – Measurement Data

Test Date: 09-21-2011
Company: Koss Corporation
EUT: CC4.5 - Left
Test: Peak Power Spectral Density - Conducted
Operator: Craig B

Comment: High Channel: Frequency – 2.462 GHz
802.11g

Limit: 8 dBm

Power in 3 kHz Bandwidth: **-16.86 dBm**



Appendix B – Measurement Data

B5.1 Peak Power Spectral Density – 802.11b mode

Rule Part: FCC Part 15.247(e)

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005)

Limit: +8 dBm/3kHz

Results: Compliant

Sample Equations: Sweep time = (SPAN / 3 kHz)
= (1.5 MHz / 3 kHz)
= 500 seconds

Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle. PSD Option 1 was used for this test.

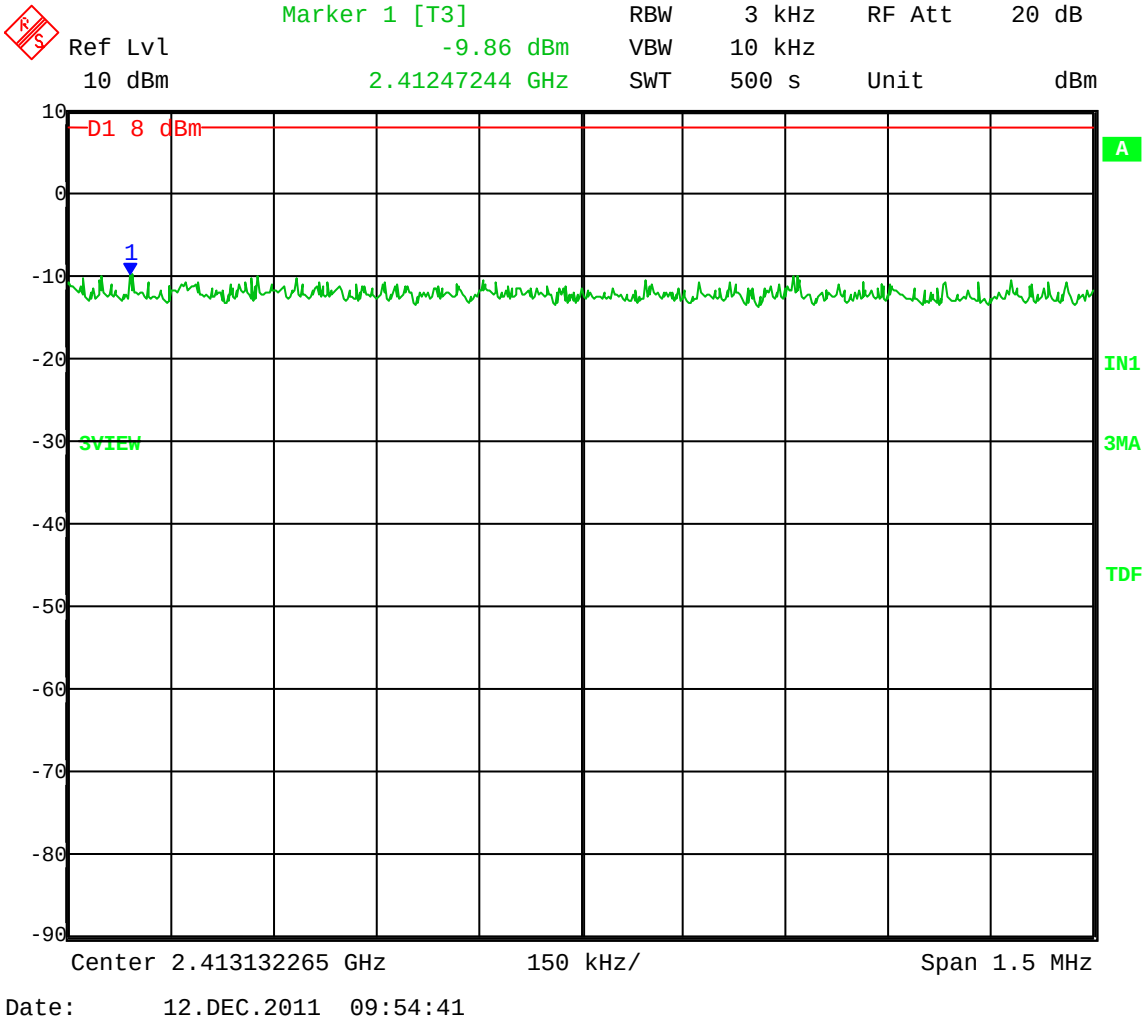
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Peak Power Spectral Density - Conducted
Operator: Craig B

Comment: Low Channel: Frequency – 2.412 GHz
802.11b

Limit: 8 dBm

Power in 3 kHz Bandwidth: **-9.86 dBm**



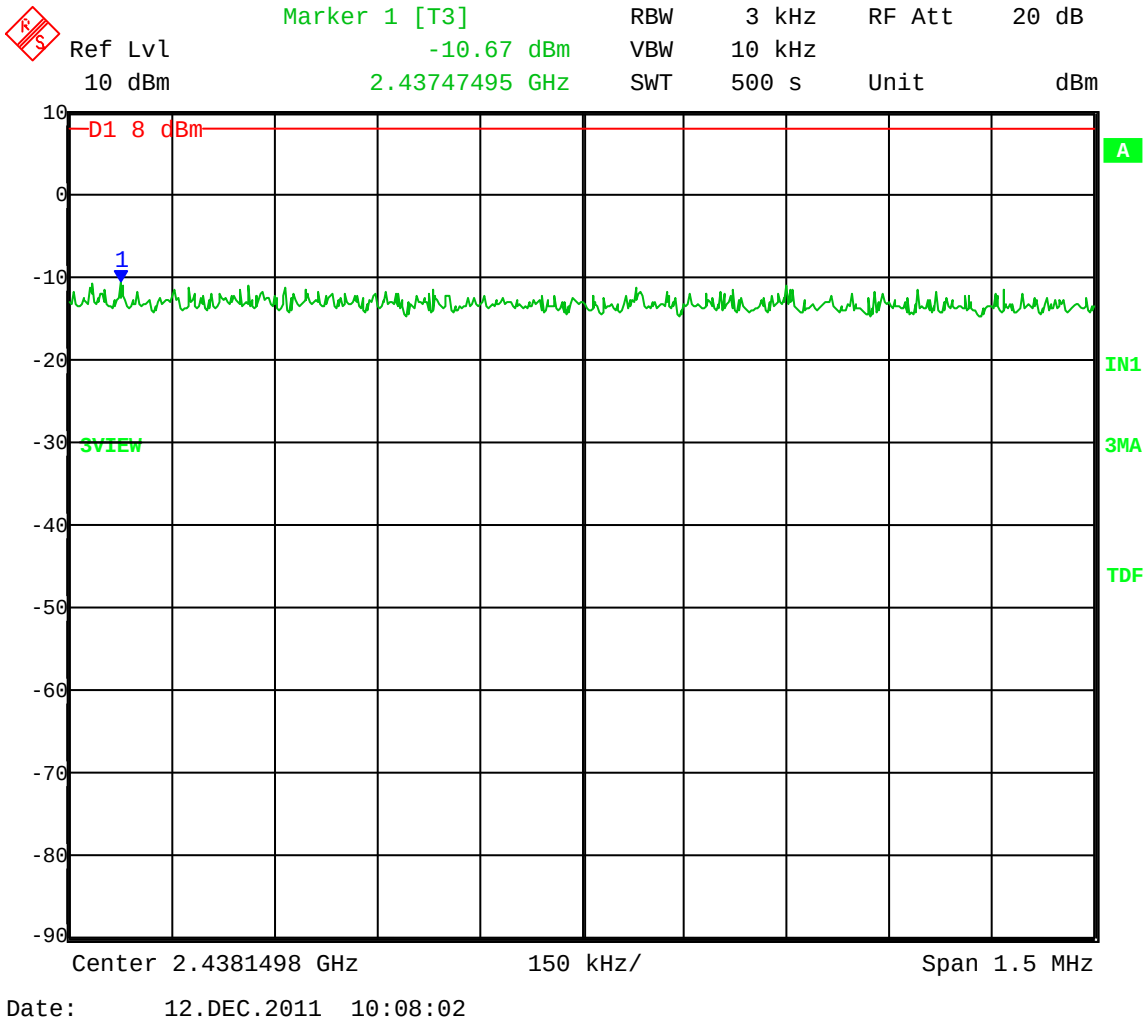
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Peak Power Spectral Density - Conducted
Operator: Craig B

Comment: Middle Channel: Frequency – 2.437 GHz
802.11b

Limit: 8 dBm

Power in 3 kHz Bandwidth: **-10.67 dBm**



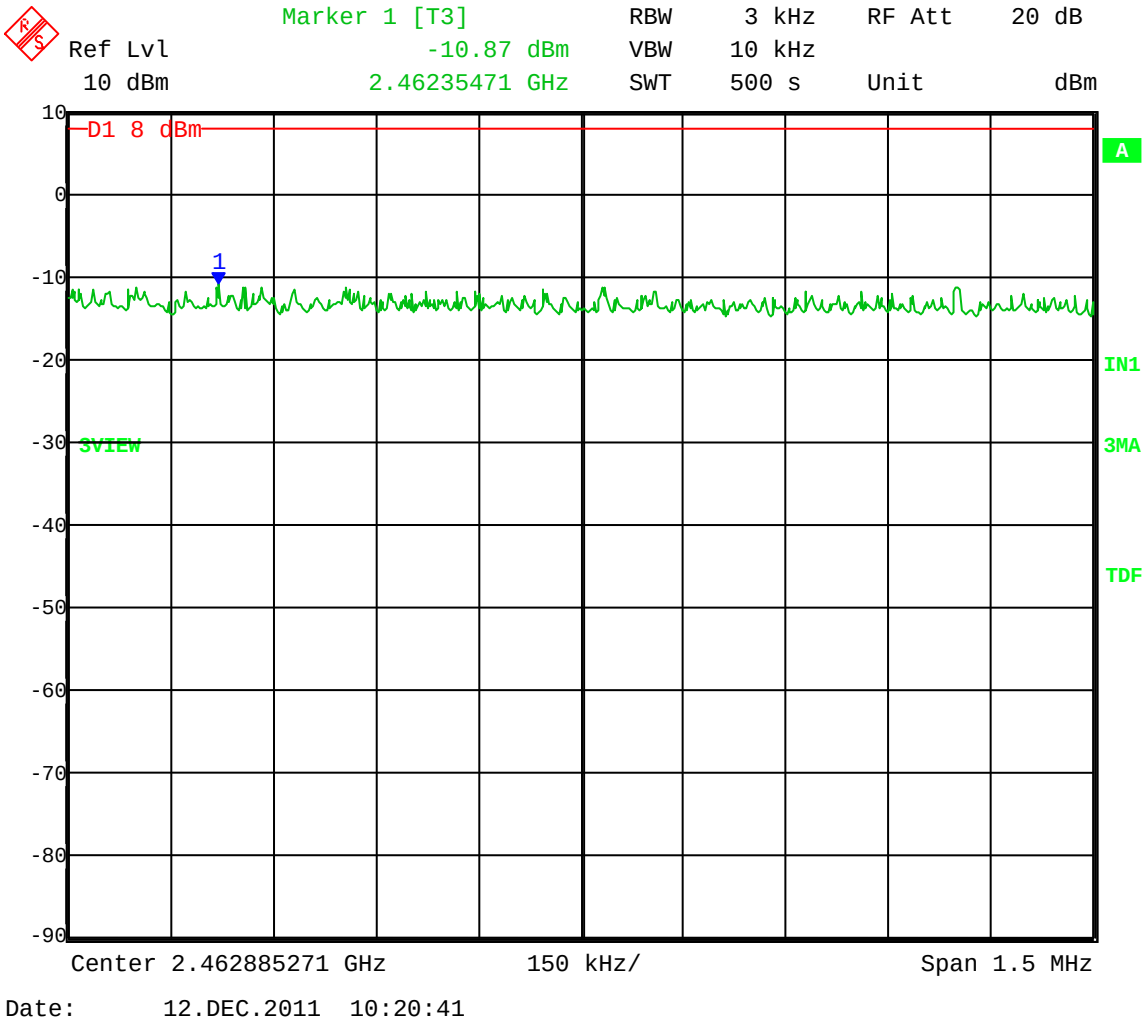
Appendix B – Measurement Data

Test Date: 12-12-2011
Company: Koss Corporation
EUT: CC4.5
Test: Peak Power Spectral Density - Conducted
Operator: Craig B

Comment: High Channel: Frequency – 2.462 GHz
802.11b

Limit: 8 dBm

Power in 3 kHz Bandwidth: **-10.87 dBm**



Appendix B – Measurement Data

B6.0 Radiated Emissions in Restricted Bands (1 to 26 GHz)

Rule Part: FCC Part 15.247(d) and FCC Part 15.205

Test Procedure: Measurement of Digital Transmission Systems Operating under Section 15.247 (March 23, 2005), FCC Publication KDB 558074

Limit: FCC Part 15.209

Results: Compliant

Notes: The EUT was set to transmit at its maximum power and maximum data rate. Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz. Since the EUT is not able to transmit continuously, compliance with the Average limits are shown by applying a duty cycle correction factor to a peak detector measurement.

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance 1 GHz to 18 GHz
Tested at a 1 Meter Distance 18 GHz to 26 GHz

EUT: CC4.5 - Left
Manufacturer: Koss Corporation
Operating Condition: 70 deg F; 50% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: 802.11b/g
Date: 09/19/2011

Notes: **(1)** Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz
(2) Since EUT is not transmitting continuously, compliance with the Average limits are shown by applying a duty cycle correction factor to a peak detector measurement.
(3) All other restricted band emissions at least 20 dB under the limit.

Channel 1 (2.412 GHz):

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
4.824	Average	Vert	65.63	33.06	-38.9	59.8	-22.2	37.6	54	16.4	Res. Band
4.824	Max Peak	Vert	65.63	33.06	-38.9	59.8	---	59.8	74	14.2	Res. Band
4.824	Average	Horz	65.55	33.06	-38.9	59.7	-22.2	37.5	54	16.5	Res. Band
4.824	Max Peak	Horz	65.55	33.06	-38.9	59.7	---	59.7	74	14.3	Res. Band
12.060	Average	Vert	Noise Floor				-22.2		54		Res. Band
12.060	Max Peak	Vert	Noise Floor				---		74		Res. Band
12.060	Average	Horz	Noise Floor				-22.2		54		Res. Band
12.060	Max Peak	Horz	Noise Floor				---		74		Res. Band
14.472	Average	Vert	Noise Floor				-22.2		54		Res. Band
14.472	Max Peak	Vert	Noise Floor				---		74		Res. Band
14.472	Average	Horz	Noise Floor				-22.2		54		Res. Band
14.472	Max Peak	Horz	Noise Floor				---		74		Res. Band
19.296	Average	Vert	52.59	40.03	-37.5	55.1	-22.2	32.9	64	31.1	Res. Band
19.296	Max Peak	Vert	52.59	40.03	-37.5	55.1	---	55.1	84	28.9	Res. Band
19.296	Average	Horz	54.65	40.03	-37.5	57.2	-22.2	35.0	64	29.0	Res. Band
19.296	Max Peak	Horz	54.65	40.03	-37.5	57.2	---	57.2	84	26.8	Res. Band

Radiated Spurious Emissions in Restricted Bands

Tested at a 3 Meter Distance 1 GHz to 18 GHz

Tested at a 1 Meter Distance 18 GHz to 26 GHz

EUT: CC4.5 - Left
Manufacturer: Koss Corporation
Operating Condition: 70 deg F; 50% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: 802.11b/g
Date: 09/19/2011

Notes: **(1)** Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz
(2) Since EUT is not transmitting continuously, compliance with the Average limits are shown by applying a duty cycle correction factor to a peak detector measurement.
(3) All other restricted band emissions at least 20 dB under the limit.

Channel 6 (2.437 GHz):

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
4.874	Average	Vert	66.87	33.10	-39.3	60.7	-22.2	38.5	54	15.5	Res. Band
4.824	Max Peak	Vert	66.87	33.10	-39.3	60.7	---	60.7	74	13.3	Res. Band
4.874	Average	Horz	67.18	33.10	-39.3	61.0	-22.2	38.8	54	15.2	Res. Band
4.874	Max Peak	Horz	67.18	33.10	-39.3	61.0	---	61.0	74	13.0	Res. Band
7.311	Average	Vert	Noise Floor				-22.2		54		Res. Band
7.311	Max Peak	Vert	Noise Floor				---		74		Res. Band
7.311	Average	Horz	Noise Floor				-22.2		54		Res. Band
7.311	Max Peak	Horz	Noise Floor				---		74		Res. Band
12.185	Average	Vert	Noise Floor				-22.2		54		Res. Band
12.185	Max Peak	Vert	Noise Floor				---		74		Res. Band
12.185	Average	Horz	Noise Floor				-22.2		54		Res. Band
12.185	Max Peak	Horz	Noise Floor				---		74		Res. Band
19.496	Average	Vert	51.20	40.05	-37.2	54.1	-22.2	31.9	64	32.2	Res. Band
19.496	Max Peak	Vert	51.20	40.05	-37.2	54.1	---	54.1	84	30.0	Res. Band
19.496	Average	Horz	53.49	40.05	-37.2	56.3	-22.2	34.1	64	29.9	Res. Band
19.496	Max Peak	Horz	53.49	40.05	-37.2	56.3	---	56.3	84	27.7	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance 1 GHz to 18 GHz
Tested at a 1 Meter Distance 18 GHz to 26 GHz

EUT: CC4.5 - Left
Manufacturer: Koss Corporation
Operating Condition: 70 deg F; 50% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: 802.11b/g
Date: 09/19/2011

Notes: **(1)** Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz
(2) Since EUT is not transmitting continuously, compliance with the Average limits are shown by applying a duty cycle correction factor to a peak detector measurement.
(3) All other restricted band emissions at least 20 dB under the limit.

Channel 11 (2.462 GHz):

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
4.924	Average	Vert	69.01	33.18	-39.7	62.5	-22.2	40.3	54	13.7	Res. Band
4.924	Max Peak	Vert	69.01	33.18	-39.7	62.5	---	62.5	74	11.5	Res. Band
4.924	Average	Horz	69.98	33.18	-39.7	63.5	-22.2	41.3	54	12.7	Res. Band
4.924	Max Peak	Horz	69.98	33.18	-39.7	63.5	---	63.5	74	10.5	Res. Band
7.386	Average	Vert	Noise Floor				-22.2		54		Res. Band
7.386	Max Peak	Vert	Noise Floor				---		74		Res. Band
7.386	Average	Horz	Noise Floor				-22.2		54		Res. Band
7.386	Max Peak	Horz	Noise Floor				---		74		Res. Band
12.310	Average	Vert	Noise Floor				-22.2		54		Res. Band
12.310	Max Peak	Vert	Noise Floor				---		74		Res. Band
12.310	Average	Horz	Noise Floor				-22.2		54		Res. Band
12.310	Max Peak	Horz	Noise Floor				---		74		Res. Band
19.696	Average	Vert	51.48	40.07	-37.1	54.5	-22.2	32.3	64	31.8	Res. Band
19.696	Max Peak	Vert	51.48	40.07	-37.1	54.5	---	54.5	84	29.6	Res. Band
19.696	Average	Horz	52.10	40.07	-37.1	55.1	-22.2	32.9	64	31.1	Res. Band
19.696	Max Peak	Horz	52.10	40.07	-37.1	55.1	---	55.1	84	28.9	Res. Band

Appendix B – Measurement Data

B6.1 Radiated Emissions (30 MHz to 1 GHz)

Rule Part: FCC 15.247(d); 15.209

Test Procedure: ANSI C63.4, 2009

Limit: FCC 15.109 / 15.209:

Frequency of Emission (MHz)	Field Strength (microvolts/meter)
30 - 88	100
88 - 216	150
216 - 960	200
Above 960	500

Results: PASS

Notes: The measurement bandwidth on the receiver was set to 120 kHz. The detector was set to Quasi-Peak. The test distance was 3 meters.

FCC Part 15 Class B

Electric Field Strength

EUT:	CC4.5
Manufacturer:	Koss Corporation
Operating Condition:	68 deg F 52% R.H.
Test Site:	DLS O.F. G1
Operator:	Craig B
Test Specification:	802.11b/g Transmit & Receive modes; Low, Mid, & High channels
Comment:	Tested with AC Adapter
	Date: 09-23-2011

TEXT: "Vert 3 meters"

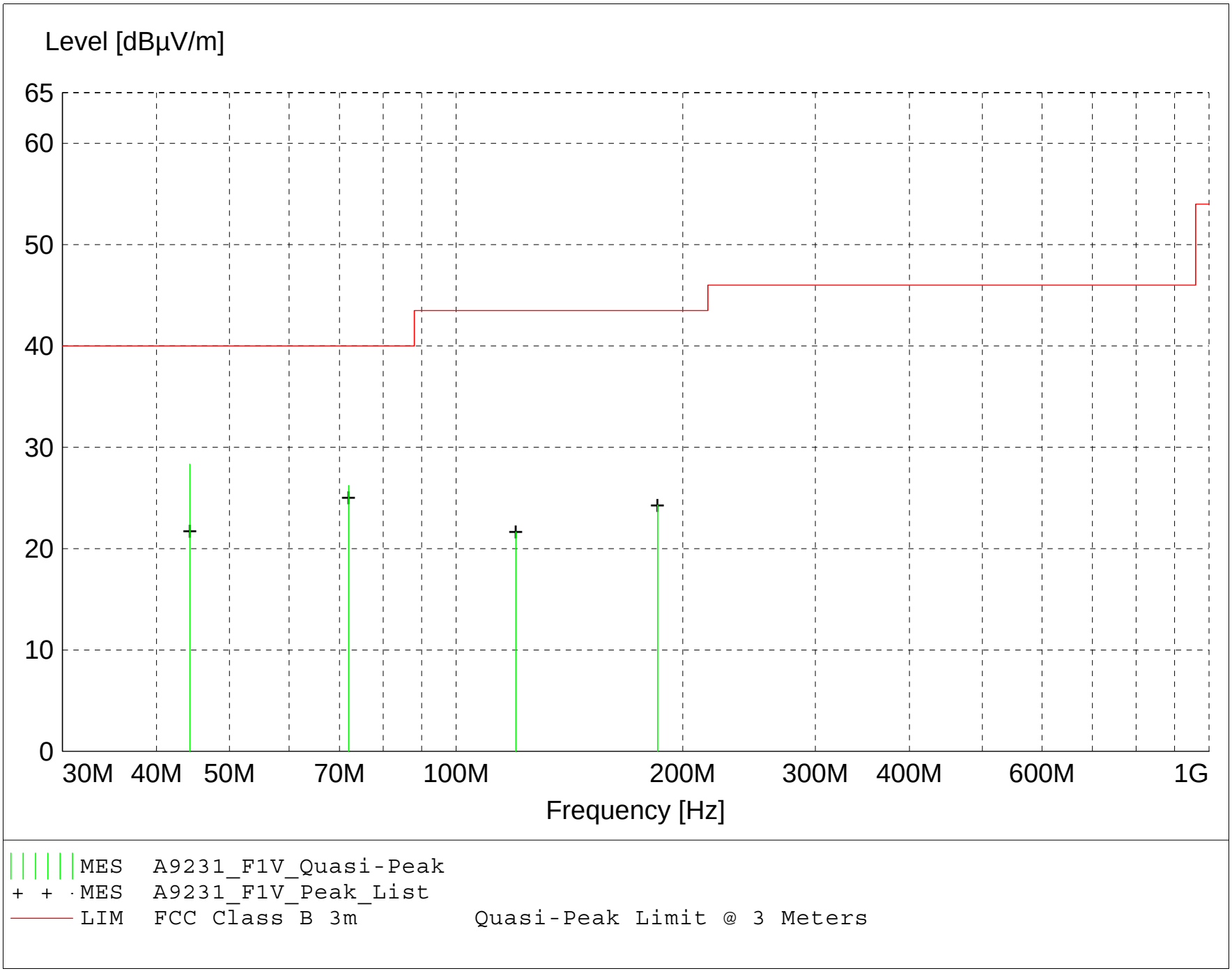
Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)

Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

Graph Markers:	+	Frequency marker (Level of marker not related to final level)
	|	Final maximized level using Quasi-Peak detector
	X	Final maximized level using Average dector
	#	Final maximized level using Peak detector
	-	Background Scan Peak Detector (Optional)
	-	Background Scan Average Detector (Optional)


Level [dBµV/m]
65
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A9231_F1V_Quasi-Peak
MES A9231_F1V_Peak_List
LIM FCC Class B 3m
Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A9231_F1V_Final"

9/23/2011 10:14AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
44.300000	41.10	12.13	-24.9	28.4	40.0	11.6	1.00	0	QUASI-PEAK	None
72.000000	42.14	8.37	-24.3	26.2	40.0	13.8	1.00	34	QUASI-PEAK	None
185.200000	27.97	18.88	-22.6	24.3	43.5	19.2	1.00	315	QUASI-PEAK	None
120.050000	30.67	14.69	-23.7	21.7	43.5	21.8	1.00	230	QUASI-PEAK	None

FCC Part 15 Class B

Electric Field Strength

EUT:	CC4.5
Manufacturer:	Koss Corporation
Operating Condition:	68 deg F 52% R.H.
Test Site:	DLS O.F. G1
Operator:	Craig B
Test Specification:	802.11b/g Transmit & Receive modes; Low, Mid, & High channels
Comment:	Tested with AC Adapter
	Date: 09-23-2011

TEXT: "Horz 3 meters"

Short Description: Test Set-up

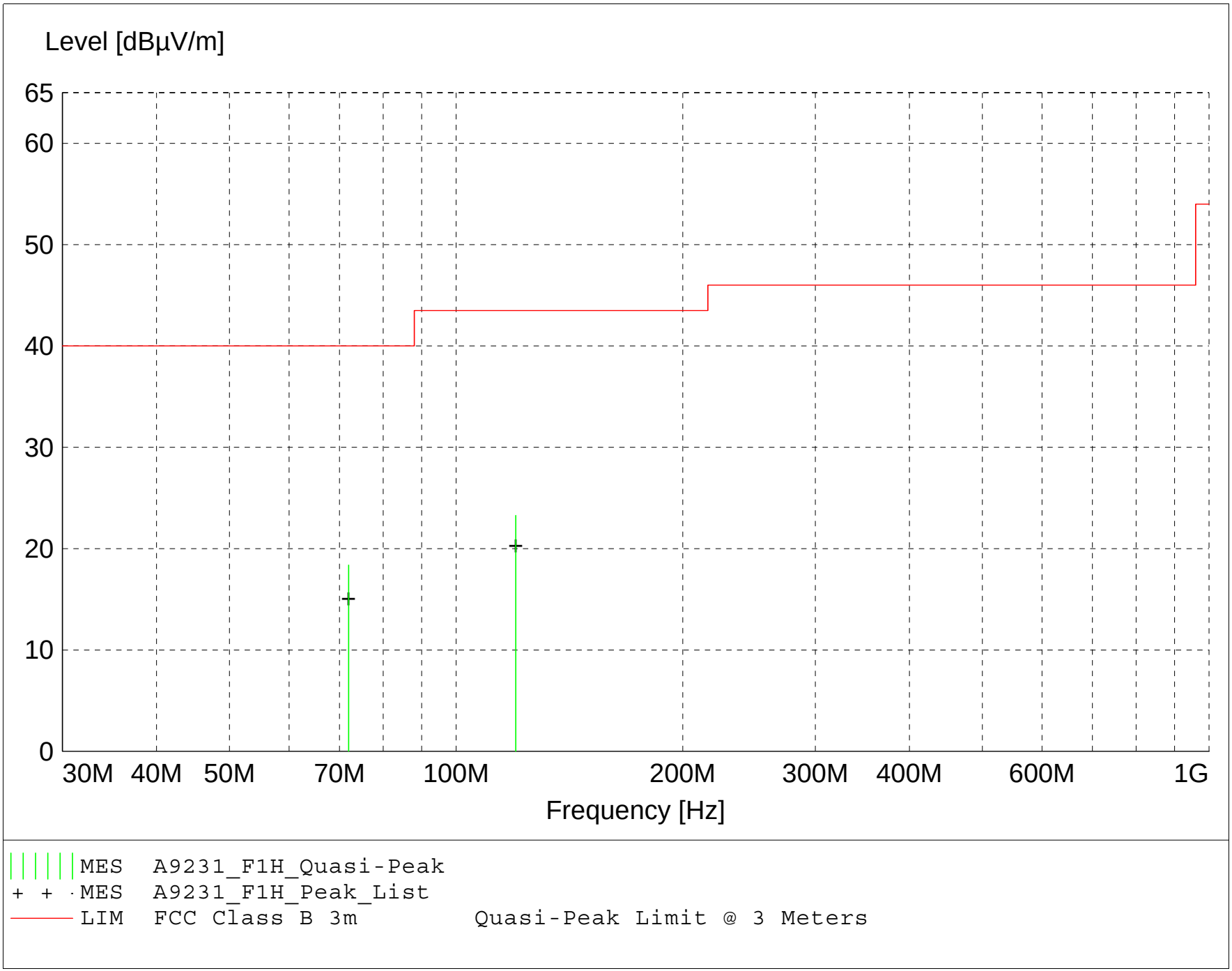
Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)

Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

Graph Markers:

+	Frequency marker (Level of marker not related to final level)
|	Final maximized level using Quasi-Peak detector
X	Final maximized level using Average dector
#	Final maximized level using Peak detector
-	Background Scan Peak Detector (Optional)
-	Background Scan Average Detector (Optional)


Level [dBµV/m]
65
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A9231_F1H_Quasi-Peak
MES A9231_F1H_Peak_List
LIM FCC Class B 3m
Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A9231_F1H_Final"

9/23/2011 10:20AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
120.000000	32.29	14.69	-23.7	23.3	43.5	20.2	1.48	235	QUASI-PEAK	None
72.000000	34.29	8.37	-24.3	18.4	40.0	21.6	1.87	227	QUASI-PEAK	None

Appendix B – Measurement Data

B7.0 Duty Cycle of Test Unit (maximum possible)

Rule Part: Section 15.35(c)

Test Procedure: ANSI C63.4-2009

Limit: Not Applicable

Results: Duty Cycle = 7.725% over a 100 ms period
Duty Cycle Correction = 22.2 dB

Sample Equations: 30 pulses during 100 ms period
0.2575 ms/pulse
Total ON time during 100 ms = 7.725 ms
20 Log (7.725/100) = 22.242
Duty cycle correction factor = 22.2 dB

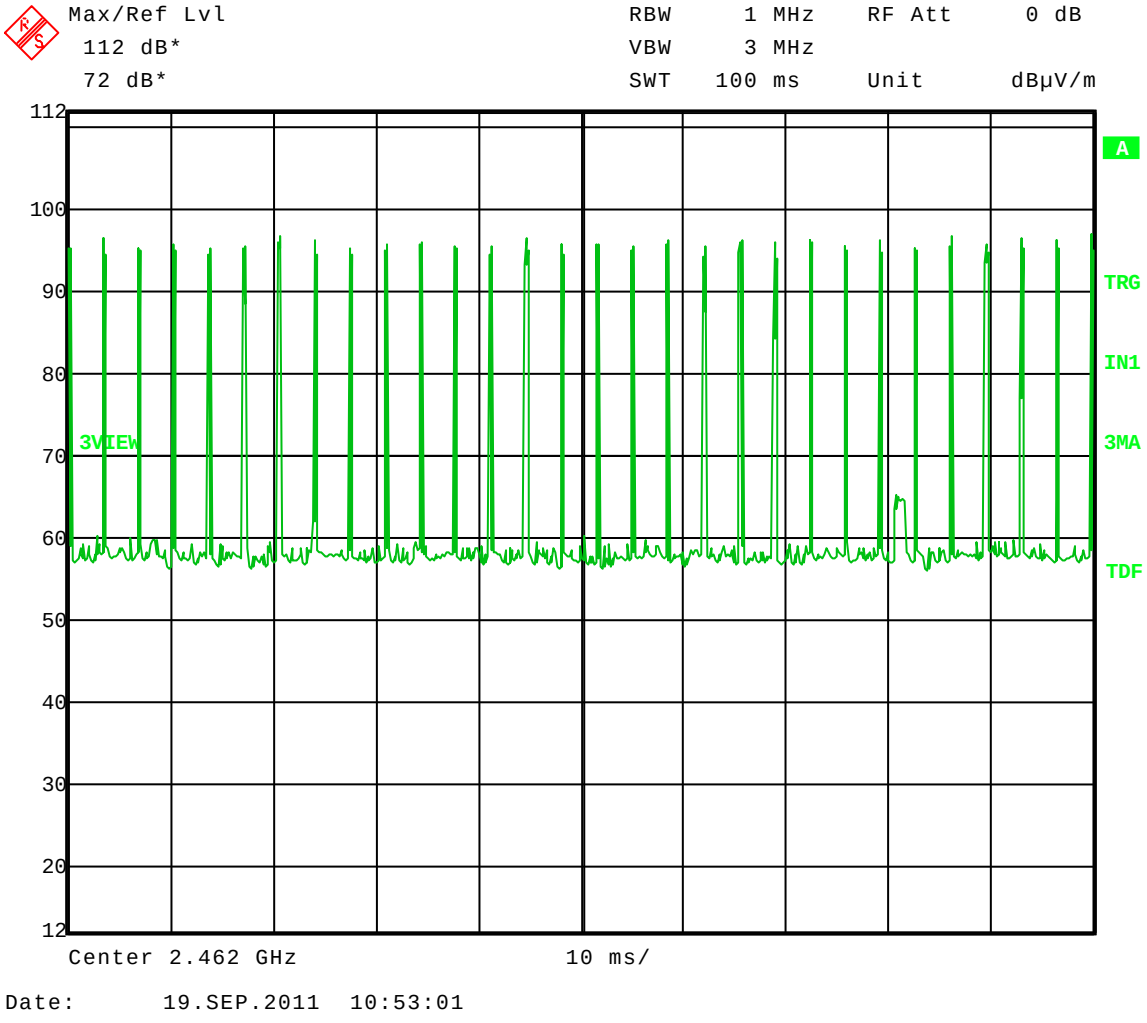
Notes: Since the EUT is not able to transmit continuously, compliance with Average limits are shown by applying a duty cycle correction factor to a peak detector measurement.

Appendix B – Measurement Data

Test Date: 09-19-2011
Company: Koss Corporation
EUT: CC4.5
Test: Duty Cycle – duty cycle used during testing (special test software)
Operator: Craig B

Comment: 30 pulses
0.2575 ms/pulse
ON time during 100 ms = 7.725 ms
20 Log (7.725/100) = 22.242
Duty cycle correction factor = 22.2 dB

Number of pulses during 100 ms period:

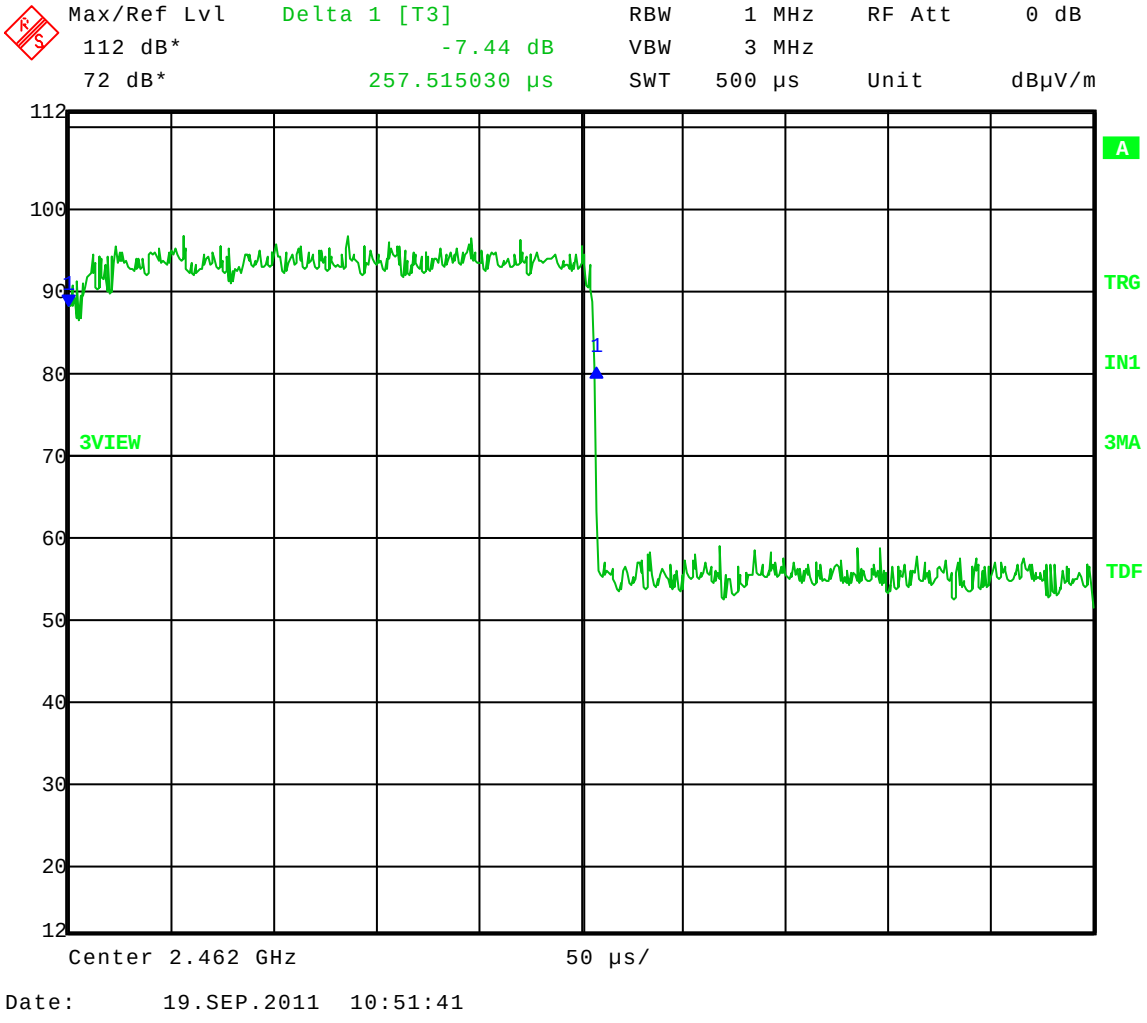


Appendix B – Measurement Data

Test Date: 09-19-2011
Company: Koss Corporation
EUT: CC4.5
Test: Duty Cycle – duty cycle used during testing (special test software)
Operator: Craig B

Comment: 30 pulses
0.2575 ms/pulse
ON time during 100 ms = 7.725 ms
20 Log (7.725/100) = 22.242
Duty cycle correction factor = 22.2 dB

ON time of one pulse:



Appendix B – Measurement Data

B8.0 AC Line Conducted Emissions

Rule Part: FCC Part 15.207

Test Procedure: ANSI C63.4-2009

Limit: 15.207(a)

Results: Compliant

Notes: This was an AC Conducted emissions measurement.
The EUT was powered from an included AC Adapter with an input of 120 VAC 60 Hz.

FCC Part 15.207 Class B

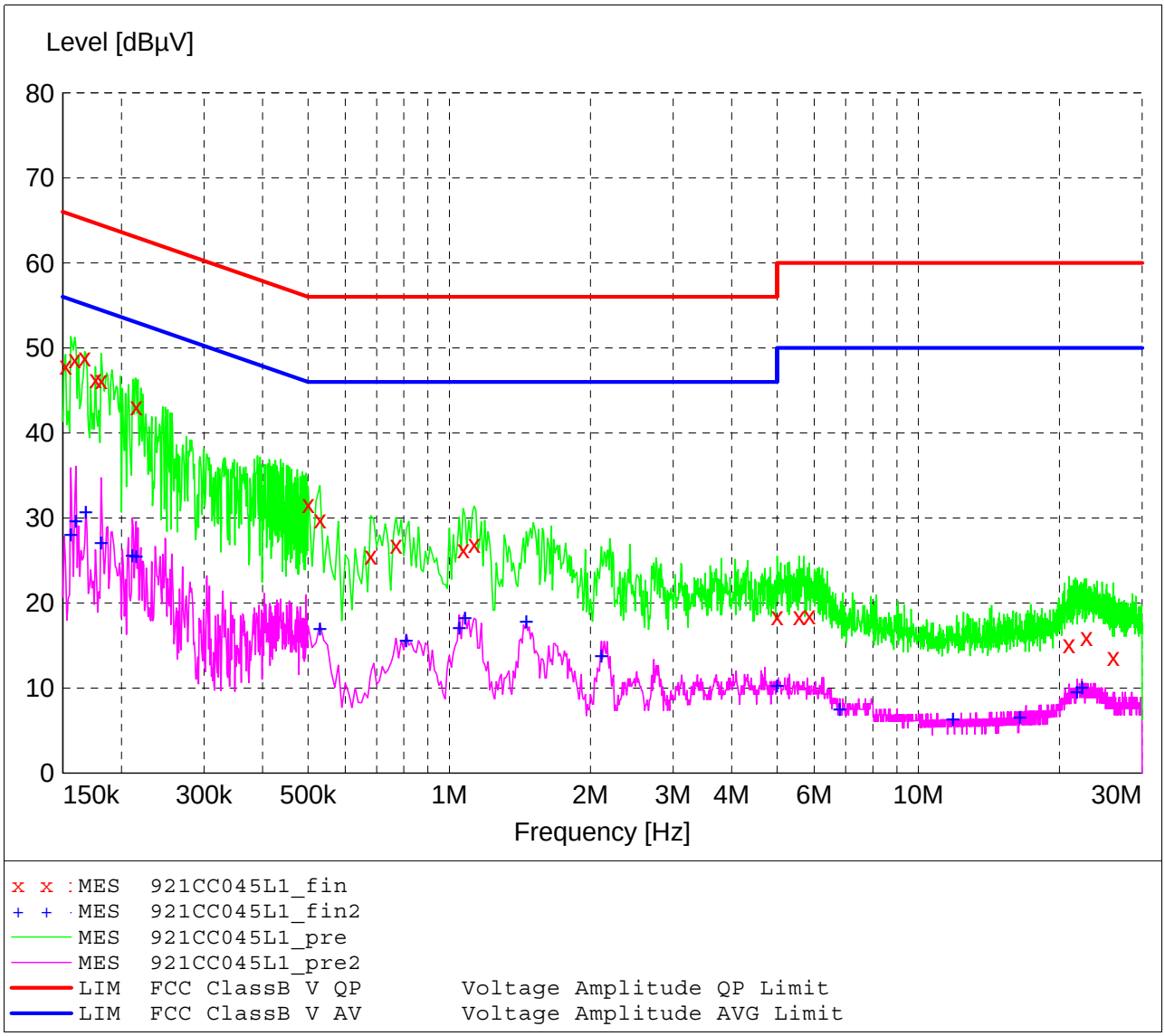
Voltage Mains Test

EUT:	CC4.5
Manufacturer:	Koss Corporation
Operating Condition:	70 deg. F, 49% R.H.
Test Site:	DLS Screen Room
Operator:	Craig B
Test Specification:	120 V 60 Hz
Comment:	Line 1; charging and transmitting
	Date: 09-21-2011

SCAN TABLE: "Line Cond SR Final"

Short Description: Line Conducted Emissions

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak CISPR AV	5.0 s	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "921CC045L1_fin"

9/21/2011 3:47PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.152000	47.90	13.7	66	18.0	QP
0.159000	48.70	13.5	66	16.8	QP
0.167000	48.90	13.3	65	16.2	QP
0.176000	46.30	13.1	65	18.4	QP
0.181000	46.20	13.1	64	18.2	QP
0.215000	43.10	12.5	63	19.9	QP
0.500000	31.60	11.1	56	24.4	QP
0.530000	29.80	11.1	56	26.2	QP
0.680000	25.60	10.9	56	30.4	QP
0.770000	26.80	10.8	56	29.2	QP
1.070000	26.30	10.7	56	29.7	QP
1.130000	26.90	10.7	56	29.1	QP
5.000000	18.40	10.8	56	37.6	QP
5.570000	18.40	10.7	60	41.6	QP
5.855000	18.60	10.7	60	41.4	QP
20.945000	15.10	11.4	60	44.9	QP
22.835000	16.00	11.5	60	44.0	QP
26.015000	13.60	11.5	60	46.4	QP

MEASUREMENT RESULT: "921CC045L1_fin2"

9/21/2011 3:47PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.156000	28.00	13.6	56	27.7	CAV
0.160000	29.60	13.5	56	25.9	CAV
0.168000	30.70	13.3	55	24.4	CAV
0.181000	27.10	13.1	54	27.3	CAV
0.211000	25.60	12.5	53	27.6	CAV
0.215000	25.50	12.5	53	27.5	CAV
0.530000	16.90	11.1	46	29.1	CAV
0.810000	15.60	10.8	46	30.4	CAV
1.050000	17.00	10.7	46	29.0	CAV
1.080000	18.20	10.7	46	27.8	CAV
1.460000	17.80	10.7	46	28.2	CAV
2.110000	13.80	10.7	46	32.2	CAV
5.000000	10.30	10.8	46	35.7	CAV
6.800000	7.50	10.8	50	42.5	CAV
11.870000	6.30	11.0	50	43.7	CAV
16.460000	6.50	11.2	50	43.5	CAV
21.815000	9.50	11.5	50	40.5	CAV
22.340000	10.00	11.5	50	40.0	CAV

FCC Part 15.207 Class B

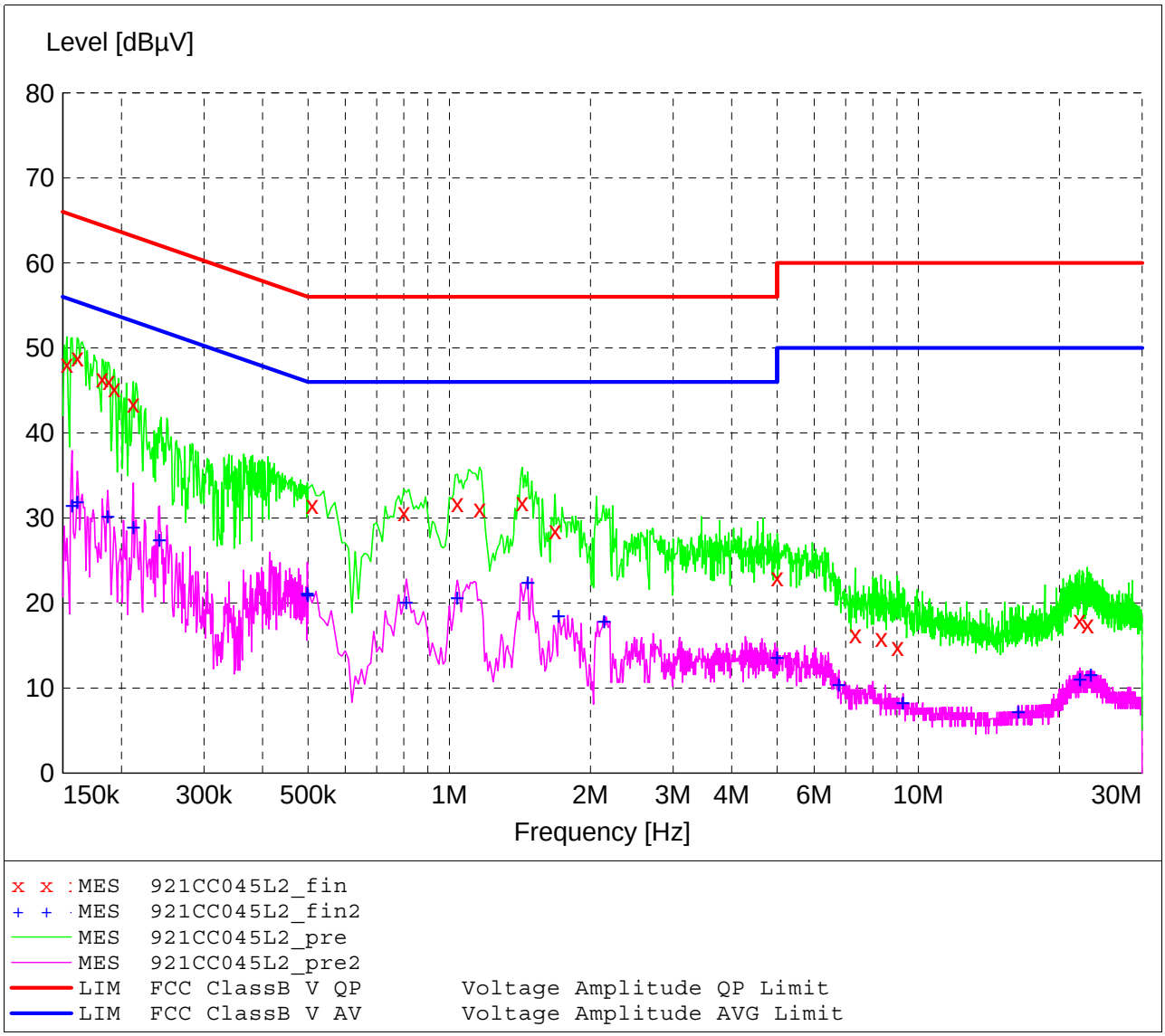
Voltage Mains Test

EUT:	CC4.5
Manufacturer:	Koss Corporation
Operating Condition:	70 deg. F, 49% R.H.
Test Site:	DLS Screen Room
Operator:	Craig B
Test Specification:	120 V 60 Hz
Comment:	Line 2; charging and transmitting
	Date: 09-21-2011

SCAN TABLE: "Line Cond SR Final"

Short Description: Line Conducted Emissions

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak CISPR AV	5.0 s	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "921CC045L2_fin"

9/21/2011 3:55PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.153000	48.10	13.7	66	17.7	QP
0.161000	48.90	13.5	65	16.5	QP
0.182000	46.40	13.0	64	18.0	QP
0.188000	46.10	13.0	64	18.0	QP
0.193000	45.30	12.9	64	18.6	QP
0.212000	43.50	12.5	63	19.6	QP
0.510000	31.50	11.1	56	24.5	QP
0.800000	30.70	10.8	56	25.3	QP
1.040000	31.70	10.7	56	24.3	QP
1.160000	31.10	10.7	56	24.9	QP
1.430000	31.90	10.7	56	24.1	QP
1.680000	28.60	10.7	56	27.4	QP
5.000000	23.00	10.8	56	33.0	QP
7.340000	16.30	10.8	60	43.7	QP
8.330000	15.90	10.8	60	44.1	QP
9.020000	14.80	10.8	60	45.2	QP
22.055000	18.00	11.5	60	42.0	QP
22.940000	17.50	11.5	60	42.5	QP

MEASUREMENT RESULT: "921CC045L2_fin2"

9/21/2011 3:55PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.157000	31.40	13.6	56	24.2	CAV
0.161000	31.80	13.5	55	23.6	CAV
0.187000	30.10	13.0	54	24.1	CAV
0.212000	28.90	12.5	53	24.2	CAV
0.241000	27.40	12.3	52	24.7	CAV
0.498000	21.10	11.1	46	24.9	CAV
0.500000	20.90	11.1	46	25.1	CAV
0.810000	20.00	10.8	46	26.0	CAV
1.040000	20.60	10.7	46	25.4	CAV
1.470000	22.40	10.7	46	23.6	CAV
1.710000	18.40	10.7	46	27.6	CAV
2.140000	17.80	10.7	46	28.2	CAV
5.000000	13.50	10.8	46	32.5	CAV
6.770000	10.40	10.8	50	39.6	CAV
9.275000	8.20	10.9	50	41.8	CAV
16.340000	7.20	11.2	50	42.8	CAV
22.100000	11.00	11.5	50	39.0	CAV
23.300000	11.50	11.5	50	38.5	CAV

END OF REPORT

Revision #	Date	Comments	By
1.0	10-11-11	Preliminary Release	CB
1.1	12-14-11	Added 802.11b mode data & changed model from CC4.5 to STRIVΛ TΛP	CB
1.2	04-23-12	Added crystal info on page 7 (verification testing done 4/11/12)	JS