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PART 15.247
IC RSS-210

TEST REPORT

For The **RF Wireless Audio Module**

Model: SoundCast SCG2

FCC ID: SUD-SCG2
IC Product Code: 5613A- SCG2

PREPARED FOR:

KSC Industries Incorporated
881 Khun Drive, Building 200
Chula Vista, CA 9194

PREPARED ON April 28, 2006

REPORT NUMBER 2006 011133-FCC

PROJECT NUMBER: 25-1133-KSC

Number of Pages: 38

DOCUMENT HISTORY

REVISION	DATE	COMMENTS
-	April 28, 2006	Prepared By: A. Laudani
-	April 28, 2006	Initial Release: Chip Fleury

NOTE: Nemko USA, Inc. hereby makes the following statements so as to conform to Chapter 10 (Test Reports) Requirements of ANSI C63.4 (2003) "Methods and Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz":

- The unit described in this report was received at Nemko USA, Inc.'s facilities on January 16, 2006 . Testing was performed on the unit described in this report on January 16, 2006 to April 28, 2006 .
- The Test Results reported herein apply only to the Unit actually tested, and to substantially identical Units.
- This report does not imply the endorsement of the Federal Communications Commission (FCC), NVLAP or any other government agency.

TABLE OF CONTENTS

CERTIFICATION

The Radio Frequency Interference (RFI) testing, data evaluation and this report have been prepared by Nemko USA, Inc., an independent electromagnetic compatibility consulting and test laboratory.

The testing and data collection were accomplished in accordance with the requirements of the ANSI, C63.4-2003 standard and the applicable sections of FCC, Part 15, Subpart B for Class "**B**" equipment. The testing was also accomplished in accordance with Industry Canada's ICES-003 standard for unintentional radiating device per EMCAB-3, Issue 3 (May 1998). Refer to the Administrative Summary for a description of the test sample.

I certify the data, data evaluation and equipment configuration herein to be a true and accurate representation of the sample's radio frequency interference emission characteristics, as of the test date(s), and for the design of the test sample used to compile this report.

FR Fleury

Chip Fleury
EMC Manager

1. ADMINISTRATIVE DATA AND TEST SUMMARY

1.1. Administrative Data

CLIENT:	**KSC Industries Incorporated** **881 Khun Drive, Building 200** **Chula Vista, CA 9194** **619-726-1668**
CONTACT:	**Jim Wei**
DATE (S) OF TEST:	January 16, 2006 to April 28, 2006
EQUIPMENT UNDER TEST (EUT):	**RF Wireless Audio Module**
Model	SoundCast SCG2
Condition Upon Receipt	Suitable for Test
TEST SPECIFICATION:	FCC, Part 15.247 IC, RSS-210 Issue 6, September 2005

1.2. Test Summary

Specification	***Frequency Range***	***Compliance Status***	***Page Number***
FCC, CFR 47, Section 15.207 Class "B" Conducted Emissions	0.45 MHz - 30.00 MHz	**PASS**	**12**
FCC, CFR 47, Section 15.209 Class "B" Radiated Emissions	30 MHz – 24835 MHz	**PASS**	**13**
RSS-Gen Issue 1, Sept. 2005 Class "B" Conducted Emissions	0.45 MHz - 30.00 MHz	**PASS**	**15**
RSS-Gen Issue 1, Sept. 2005 Class "B" Radiated Emissions	30 MHz – 24835 MHz	**PASS**	**16**
FCC, CFR 47, Section 15.247 15.247 (a)(1)(iii)	2403.5 – 2479.1 MHz	**PASS**	**18-30**
RSS-210 Issue 6, September 2005 ANNEX 8	2403.5 – 2479.1 MHz	**PASS**	**18-30**

Refer to the test results section for further details.

2.SYSTEM CONFIGURATION

2.1. Description and Method of Exercising the EUT

SoundCast SCG2 was powered by its AC power supply for non-intentional emissions tests of 15.107 and 15.109. For 15.247, a variable power supply was used to verify no RF output power level changes as the input voltage was varied by +/- 15%. Test modes were set with a laptop computer thru a serial port and the laptop removed from the test set up during data collection. The antenna is integral to the module.

2.2. System Components and Power Cables

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT - **RF Wireless Audio Module**	**KSC Industries Incorporated** SoundCast SCG2 **Serial #:** NA	N/A
EUT Test Computer	**KSC Industries Incorporated** Removed after programming	N/A
AC Power Supply	**KSC Industries Incorporated** Model U060040d12	2 Prong 120 Vac 60 Hz 6.5 W 6VDC 400 mA

2.3. Device Interconnection and I/O Cables

CONNECTION	I/O CABLE
No connections	

2.4. Design Modifications for Compliance

Device: **RF Wireless Audio Module**

Model: SoundCast SCG2

The following design modifications were made to the EUT during testing.

No design modifications were made to the EUT during testing.

3. DESCRIPTION OF TEST SITE AND EQUIPMENT

3.1. Description of Test Site

The test site is located at 11696 Sorrento Valley Road, Suite F, San Diego, CA 92121. The site is physically located 18 miles Northwest of downtown San Diego. The general area is a valley 1.5 miles east of the Pacific Ocean. This particular part of the valley tends to minimize ambient levels, i.e. radio and TV broadcast stations and land mobile communications. The three and ten-meter Open Area Test Site (OATS) is located behind the office/lab building. It conforms to the normalized site attenuation limits and construction specifications as set in the EN 55022 (1998), CISPR 16 (2000) and 22 (1997) and ANSI C63.4-2003 documents.

4. DESCRIPTION OF TESTING METHODS

4.1. Introduction

As required in 47 CFR, Parts 2 and 15, the methods employed to test the radiated and conducted emissions (as applicable) of the EUT are those contained within the American National Standards Institute (ANSI) document C63.4-2003, titled "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz." All applicable FCC Rule Sections that provide further guidance for performance of such testing are also observed.

For General Test Configuration please refer to Figure 1 on the following page.

Digital devices sold in Canada are required to comply with the Interference Causing Equipment Standard for Digital Apparatus, ICES-003. These test methods and limits are specified in the Canadian Standards Association's (CSA) Standard C108.8-M1983 (1-1-94 version) and are "essentially equivalent" with FCC, Part 15 and CISPR 22 (EN55022) rules for unintentional radiators per EMCAB-3, Issue 3 (May 1998). No further testing is required for compliance to ICES-003.

4.2. Configuration and Methods of Measurements for Conducted Emissions

Section 7 of ANSI C63.4 determines the general configuration of the EUT and associated equipment, as well as the test platform for conducted emissions testing. Tabletop devices are placed on a non-conducting surface 80 centimeters above the ground plane floor and 40 centimeters from the ground plane wall. The EUT and associated system are configured to operate continuously, representing a "normally operating" mode. The EUT is powered via a Line Impedance Stabilization Network (LISN). The emissions are recorded using the required bandwidth of 9 kHz in the quasi-peak mode. The average amplitude is also observed employing a 10 kHz bandwidth to determine the presence of broadband RFI. When such interference is caused by broadband sources (as defined by the FCC and ANSI Rules), the deviation guidelines contained in Section 11.3.1 of ANSI C63.4 are employed, which allows a correction factor of 13 dB to be subtracted from the quasi-peak reading. The emission levels are then compared to the applicable FCC limits to determine compliance.

4.3. Configuration and Methods of Measurements for Frequency Identification

When performing all testing of equipment, the actual emissions of the EUT are segregated from ambient signals present within the laboratory or the open-field test range. Preliminary testing is performed to ensure that ambient signals are sufficiently low to allow for proper observation of the emissions from the EUT. Incoming power lines are filtered using a 120 dB, 30-ampere; 115/208-volt filter to assist in reducing ambient signals for tests of levels of conducted emissions. Ambients within the laboratory are compared to those noted at the nearby open-field site to discriminate between signals produced from the EUT and ambient signals. In the event that a significant emission is produced by the EUT at a frequency which is also demonstrating significant ambient signals, the spectrum analyzer is placed in the peak mode, the bandwidth is narrowed, the EUT's signal is centered on the analyzer, the scan width is expanded to 50 kHz while monitoring the audio to ensure that only the EUT signal is present, the analyzer is switched to quasi-peak mode, and the level of the EUT signal is recorded.

4.4. Configuration and Methods of Measurements for Radiated Emissions

Section 8 of ANSI C63.4 determines the general configuration and procedures for measuring the radiated emissions of equipment under test. Initially, the primary emission frequencies are identified inside the test lab by positioning a broadband receive antenna one meter from the EUT to locate frequencies of significant radiation. Next, the EUT and associated system are placed on a turntable on a ten meter open area test site (registered with the FCC in accord with its Rules and ANSI C63.4) and the receive antenna is located at a distance of ten meters from the EUT.

The EUT and associated system are configured to operate continuously, representing a "normally operating" mode. All significant radiated emissions are recorded when maximum radiation on each frequency is observed, in accordance with part 8 of ANSI C63.4-2003 and Section 15.33 of the FCC Rules. To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to horizontal and vertical polarities, and the turntable is also rotated to determine the worst emitting configuration. The numerical results of the test are included herein to demonstrate compliance.

The numerical results that are applied to the emissions limits are arrived at by the following method:
Example: A=RR+CL+AF
A = Amplitude dBuV/M
RR = Receiver Reading dBuV
CL = cable loss dB
AF = antenna factor dBm

Example Frequency = 110MHz
18.5 dBuV (spectrum analyzer reading)
+3.0 dB (cable loss @ frequency)
21.5 dBuV
+15.4 dBm (antenna factor @ frequency)
36.9 dBuV/M Final adjusted value

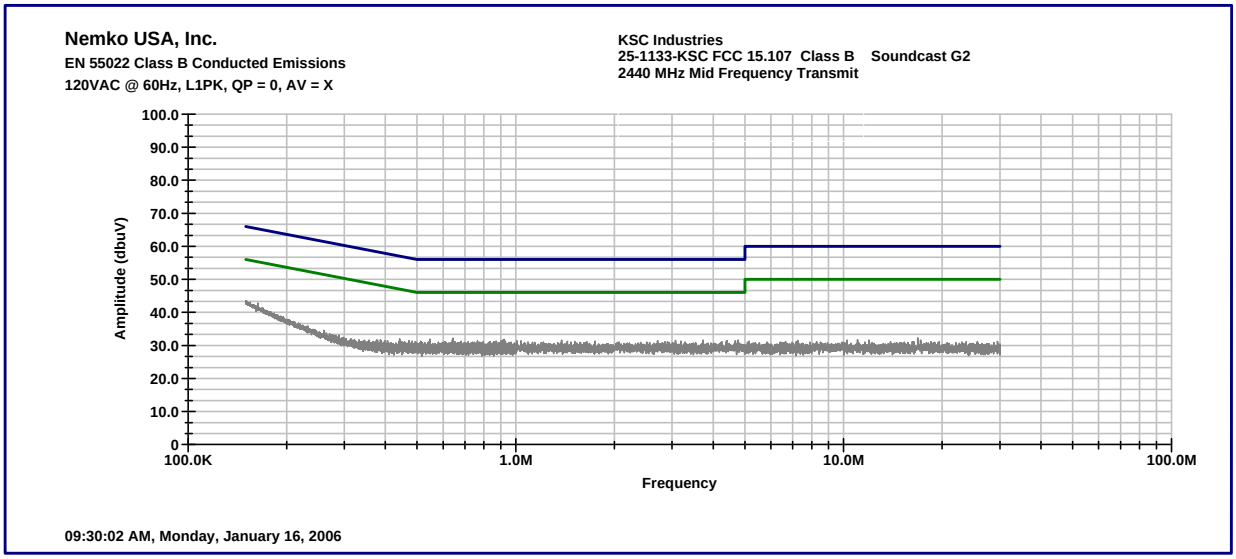
The final adjusted value is then compared to the appropriate emission limit to determine compliance.

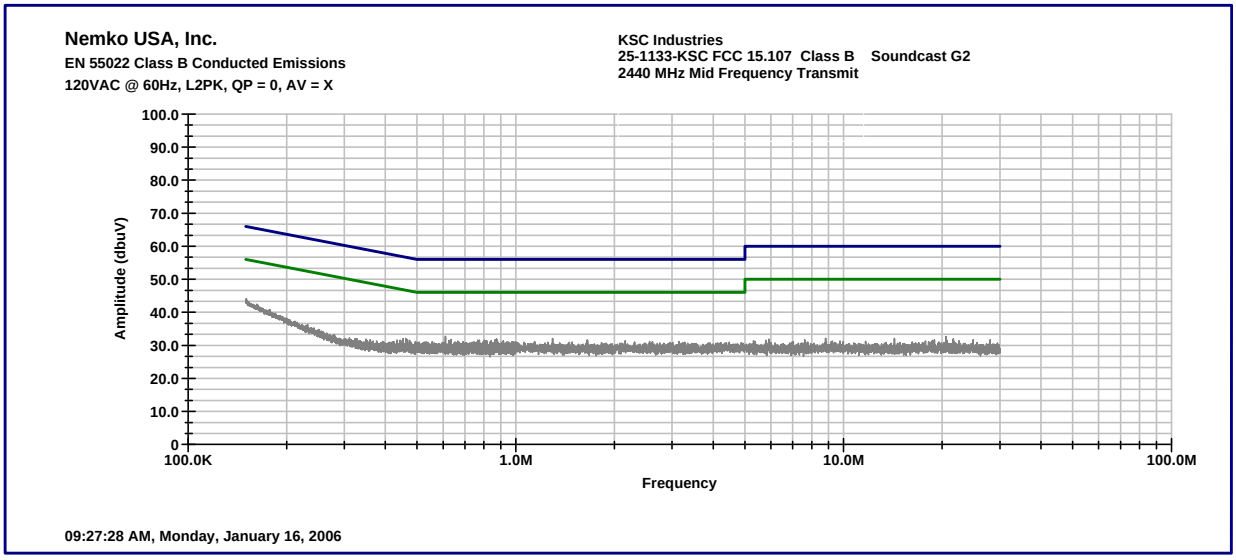
For Radiated Emissions Test Configuration please refer to Figure 4 on the following page.

5. TEST RESULTS

5.1. Conducted Emissions

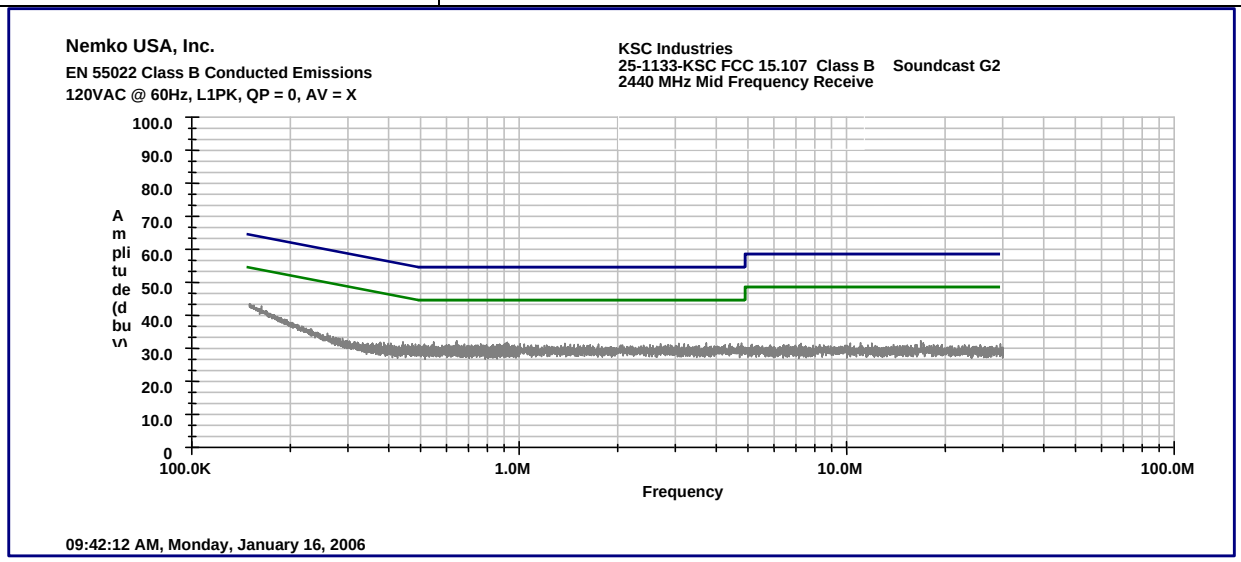
Conducted Emissions Test Data	Transmit Emissions

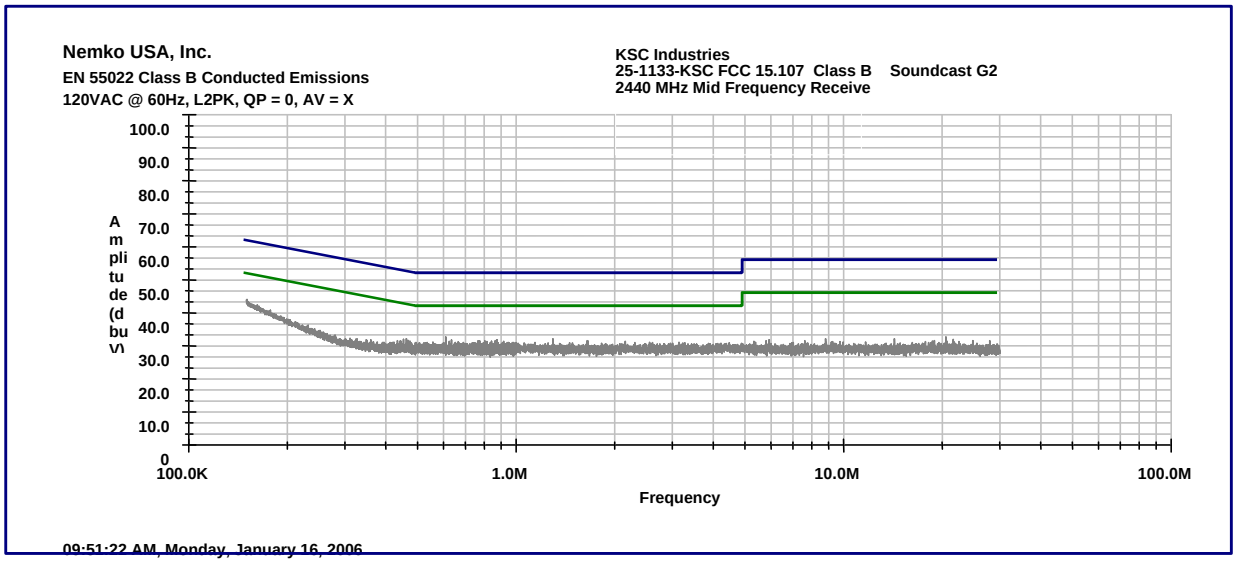




RSS-GEN 7.2

Conducted Emissions Test Data	Receive Emissions





Conducted Emissions Test Equipment

Client	**KSC Industries Incorporated**	EUT Name	SoundCast
PAN #	25-1133-KSC	EUT Model	SCG2

Asset Number	Description	Model Number	Serial Number	Last Cal	Cal Due
107	Spectrum Analyzer, HP	85680B	2415A00373	8/11/05	2/11/06
534	Spectrum Analyzer Display, HP	85662A	2534A10452	8/11/05	2/11/06
538	Quasi-Peak Adapter, HP	85650A	2521A00588	8/11/05	2/11/06
805	LISN, Solar	9348-50-R-24-BNC	992823	11/25/05	11/25/06
681	Transient Limiter, HP	11947A	3107A02634	11/25/06	11/25/06
574	High Pass Filter, Solar	7801-5.0	853135	4/12/05	4/12/06

5.2. Radiated Emissions

Radiated Emissions Data

Complete	X			Job # :	25-1133-KSC
Preliminary				Page	1
Test # :	1			of	1

Client Name :	KSC Industries				
EUT Name :	Soundcast				
EUT Model # :	SCG2				
EUT Part # :					
EUT Serial # :					
EUT Config. :	Transmit 2442 MHz				
Specification :	EN55022: 1998, Class B			Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :	14	Date :	1/17/2006
Bicon Ant.#:	128	Humidity (%) :	25	Time :	
Log Ant.#:	111	EUT Voltage :	120	Staff :	AL
DRG Ant. #	NA	EUT Frequency :	60	Photo ID:	
Dipole Ant.#:	NA	Phase:	1	Peak Bandwidth:	100 kHz
Cable#:	SOATS2	Location:	SOATS	Video Bandwidth	100 kHz
Preamp#:	901	Distance:	3m		
Spec An.#:	840				
QP #:	438				
PreSelect#:	NA				

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
49.1	V	0	50.4	11.1	1.3	31.9	31.0	40.0	-9.0	Pass	
67.5	V	0	41.5	11.4	1.5	31.9	22.5	40.0	-17.5	Pass	
135.1	V	0	30.3	11.5	1.8	31.9	11.7	40.0	-28.3	Pass	
233.5	H	0	26.4	10.8	1.8	31.9	7.1	47.0	-39.9	Pass	
245.8	H	0	43	11.2	1.8	31.9	24.1	47.0	-22.9	Pass	
257.9	H	0	29.6	11.8	1.8	31.9	11.3	47.0	-35.7	Pass	

RSS Spurious Emissions Receive 7.2.3

Emissions reported below, Emissions were searched over a range of 30 MHz to 12750 MHz

Radiated Emissions Data

Complete	X			Job # :	25-1133-KSC
Preliminary				Page	1
Test # :	2				
of	1				

Client Name :	KSC Industries				
EUT Name :	Soundcast				
EUT Model # :	SCG2				
EUT Part # :					
EUT Serial # :					
EUT Config. :	Receive (2442 MHz)				
Specification :	EN55022: 1998, Class B			Reference :	
Rod. Ant. #:	NA	Temp. (deg. C) :	14	Date :	1/17/2006
Bicon Ant.#:	128	Humidity (%) :	25	Time :	
Log Ant.#:	111	EUT Voltage :	120	Staff :	AL
DRG Ant. #	NA	EUT Frequency :	60	Photo ID:	
Dipole Ant.#:	NA	Phase:	1	Peak Bandwidth:	100 kHz
Cable#:	SOATS2	Location:	SOATS	Video Bandwidth	100 kHz
Preamp#:	901	Distance:	3m		
Spec An.#:	840				
QP #:	438				
PreSelect#:	NA				

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	Comment
49.1	V	0	50.4	11.1	1.3	31.9	31.0	40.0	-9.0	Pass	
67.5	V	0	41.5	11.4	1.5	31.9	22.5	40.0	-17.5	Pass	
135.1	V	0	30.3	11.5	1.8	31.9	11.7	40.0	-28.3	Pass	
233.5	H	0	26.4	10.8	1.8	31.9	7.1	47.0	-39.9	Pass	
245.8	H	0	43	11.2	1.8	31.9	24.1	47.0	-22.9	Pass	
257.9	H	0	29.6	11.8	1.8	31.9	11.3	47.0	-35.7	Pass	

Radiated Emissions Test Equipment

Client	**KSC Industries Incorporated**	EUT Name	SoundCast
PAN #	25-1133-KSC	EUT Model	SCG2ER

Asset Number	Description	Model Number	Serial Number	Last Cal	Cal Due
111	Antenna, LPA, EMCO	3146	1382	2/3/05	2/3/06
128	Antenna, Bicon, EMCO	3104	2882	10/6/05	10/6/06
901	pre amp, Sonoma Instrument 310	310 N	130607	12/19/05	12/19/06
438	Quasi-Peak Adapter, HP	85650A	2521A00618	11/25/05	11/25/06
840	Spectrum Analyzer, HP	85680B	2416A00394	11/25/06	11/25/06
625	Antenna, Dbl Ridge Horn, EMCO	3116	2325	2/3/06	2/3/07

5.3. Duty Cycle Measurement

RSS-210 Annex 8.1(4)

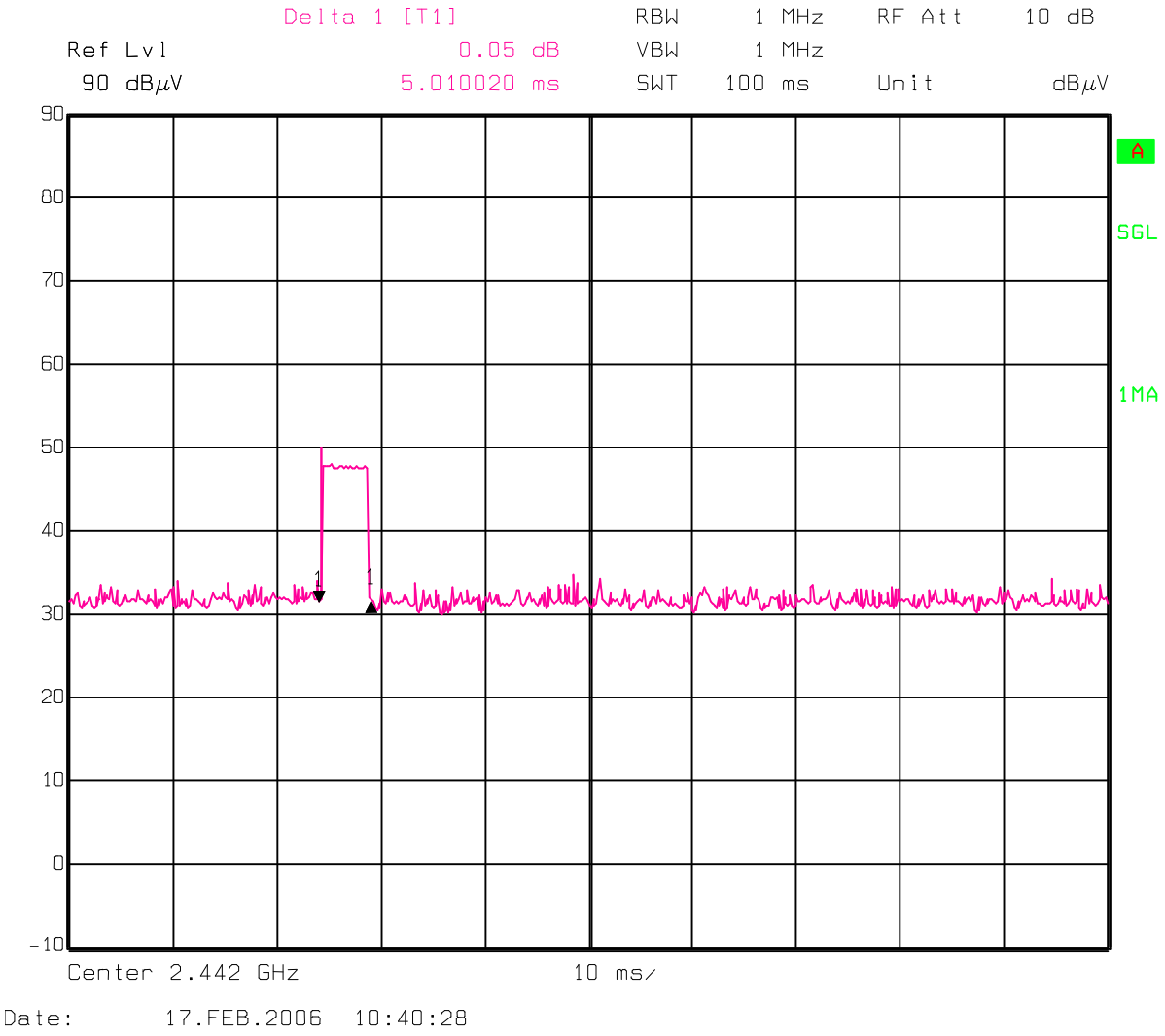
Digital Word = 5 milliseconds

Duty cycle = 5 milliseconds in 100 ms

Duty cycle = 0.05 %

Duty Cycle Factor (DCF) = 20* log(.05) = -26 dB.

FCC 15.35(c) restricts DCF to -20 dB



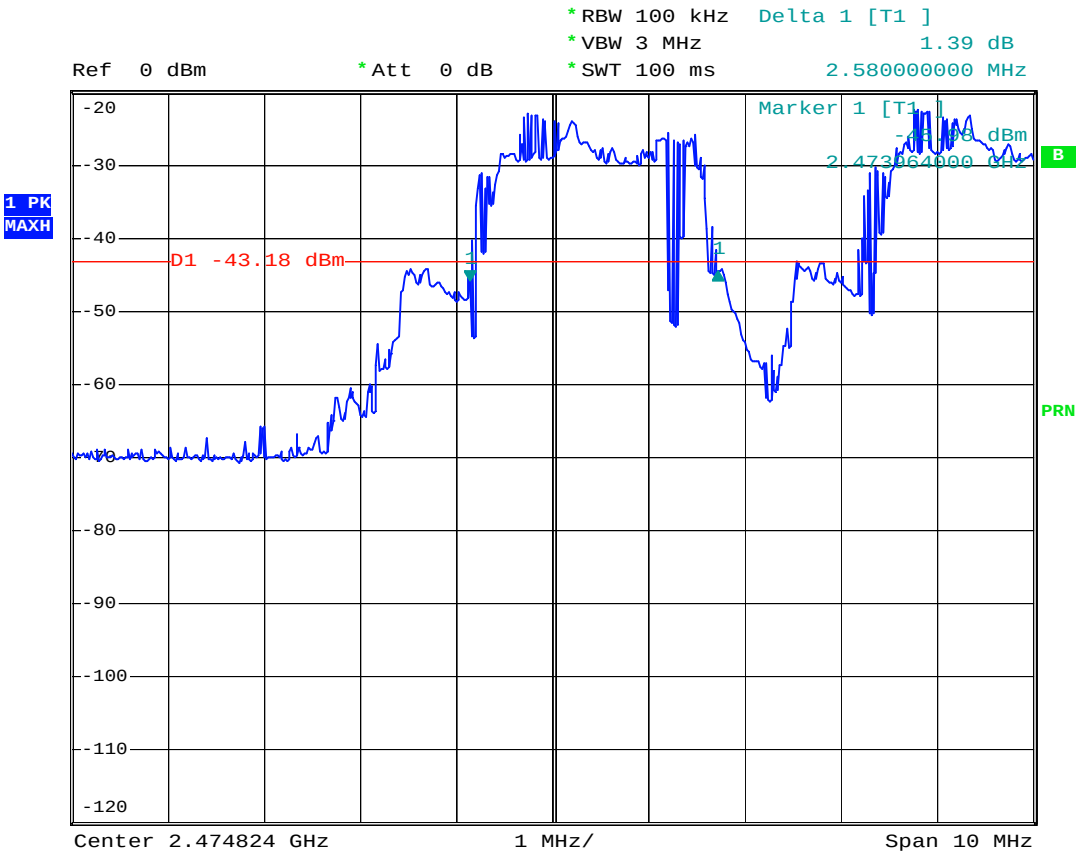
5.4. Bandwidth

RSS-210 Annex 8.1(2)

(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

15.247 (a)(1)

Bandwidth = 2.473 MHz



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5.5. Power Level and Radiated Spurious Emissions

RSS-210 Annex 8.4(2)

(a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

The EUT was tested with the antenna in three orthogonal orientations and the worst case emissions are presented below.

Power Level Limits 125 mWatt or 115.3 dBuV/m @ 3m. EUT complies.

$10^{[(\text{Field Strength in dBuV/m} - 120)/20]}$ = Field Strength in V/m

$[(\text{Field Strength in V/m} \times 3\text{m})/5.48]^2$ = Power in Watts

Measured 113.5 dBuV/m @ 3m which translates to a RF power of 0. 067 W

Spurious Limits

15.209: 74 Peak, 54 Ave. dBuV/m @ 3m.

15.205 Restricted bands

Spurious emissions were searched for from 1000 MHz to 10 times the highest transmit frequency or 25000 MHz.

Radiated Emissions Data

Complete: x — Job # : 25-1133-KSC — Test # : 3
Preliminary: — Page 1 of 1

Client Name : KSC Industries
EUT Name : Soundcast
EUT Model # : SCG2
EUT ANTENNA Part # :
EUT Serial # :
EUT Config. : Transmit, FSK
The spectrum from 30 MHz to 24835 MHz was scanned. The voltage was changed from 5.7 to 6.3 V and no effect noted.
Specification : FCC Part 15.247C, 15.209, 15.205(a) — Reference :

Rod. Ant. #:	NA	Temp. (deg. C) :	13	Date :	2/17/2006
Bicon Ant.#:	NA	Humidity (%) :	47	Time :	
Log Ant.#:	NA	EUT Voltage :	6 Vdc	Staff :	AL
DRG Ant. #	529	EUT Frequency :		Photo ID:	
Dipole Ant.#:	NA	Phase:		Peak Res Bandwidth:	1 MHz
Cable#:	40ft	Location:	SOATS	Peak Video Bandwidth	1 MHz
Preamp#:	317	Distance:	3M		
Spec An.#:	840	Duty cycle factor	-20.0		
QP #:	NA				
PreSelect#:	NA				

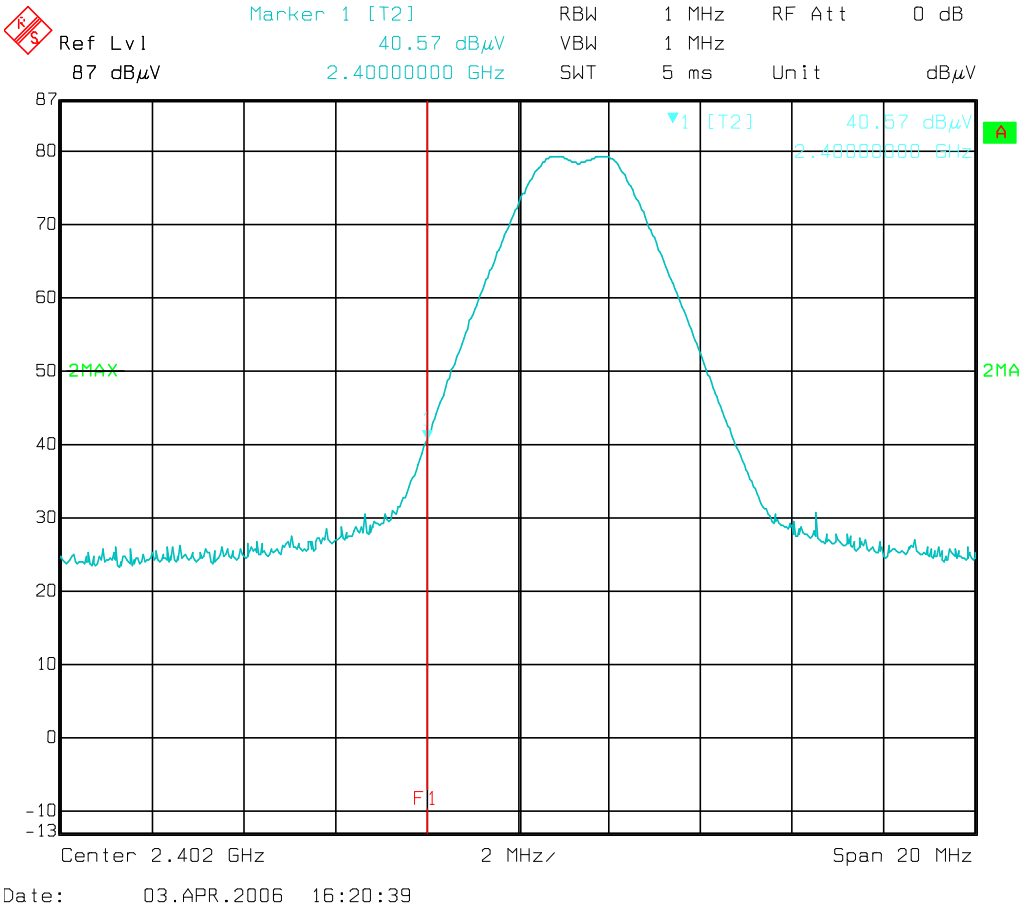
Meas. Freq. (MHz)	Vertical (dBuV) pk	Vertical (dBuV) av	Horizontal (dBuV) pk	Horizontal (dBuV) av	CF (db)	Max Level (dBuV/m) pk	Max Level (dBuV/m) av	Spec. Limit (dBuV/m) pk	Spec. Limit (dBuV/m) av	Margin dB pk	Margin dB av	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
2400	39.7	19.7	33.5	13.5	32.1	71.8	51.8	93.3	73.3	-21.5	-21.5	30	1.3	Pass	bandedge
2403.5	79.9	59.9	64.8	44.8	33.4	113.3	93.3	116.2		-2.9		30	1.0	Pass	RBW = 5 MHz, VBW= 10MHz
4807.0	58.7	38.7	57.1	37.1	-6.1	52.6	32.6	74.0	54.0	-21.4	-21.4	30	1.0	Pass	
7210.5	54.7	34.7	55.1	35.1	3.3	58.4	38.4	74.0	54.0	-15.6	-15.6	30	1.0	Pass	
2442.0	79.6	59.6	73.3	53.3	32.1	111.7	91.7	116.2		-4.5		30	1.3	Pass	RBW = 5 MHz, VBW= 10MHz
4884.0	56.2	36.2	54.1	34.1	-5.4	50.8	30.8	74.0	54.0	-23.2	-23.2	30	1.0	Pass	
7326.0	51.9	31.9	50.7	30.7	3.3	55.2	35.2	74.0	54.0	-18.8	-18.8	30	1.0	Pass	
9768.0	44.6	24.6	43.2	23.2	9.5	54.1	34.1	74.0	54.0	-19.9	-19.9	30	1.0	Pass	
2483.5	35.3	15.3	32.6	12.6	32.1	67.4	47.4	74.0	54.0	-6.6	-6.6	30	1.2	Pass	bandedge
2479.1	81.4	61.4	70.5	50.5	32.1	113.5	93.5	116.2		-2.7		30	1.0	Pass	RBW = 5 MHz, VBW= 10MHz
4958.2	51.3	31.3	48.2	28.2	-5.4	45.9	25.9	74.0	54.0	-28.1	-28.1	30	1.0	Pass	
7437.3	51.9	31.9	49.1	29.1	3.3	55.2	35.2	74.0	54.0	-18.8	-18.8	30	1.0	Pass	

5.6. Bandedge Emissions

Lower Band Edge

PEAK Complies
Correction factor for cable loss and antenna factor = 32.1 dB
Limit = -20 dBc = 113.3 –20 = 93.3 dBuV/m
Peak = 40.6 + 32.1 (Correction Factor) = 72.7 dBuV/m

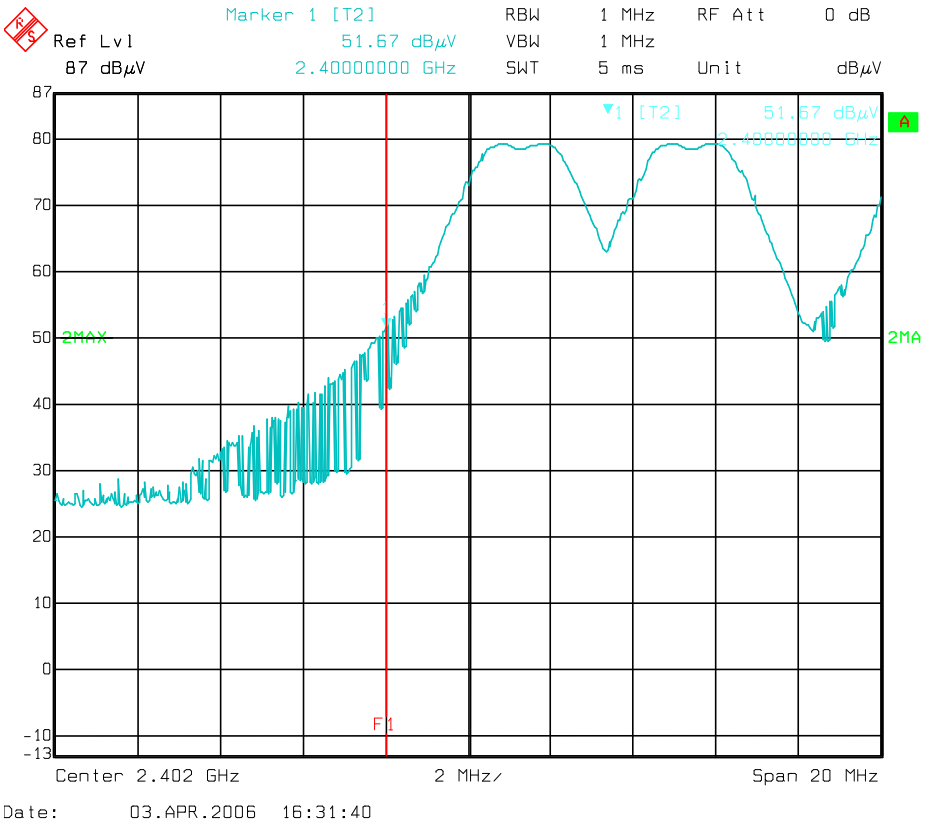
Not Hopping



Average Complies
Average Limit = Peak – 20 dBc – Duty Cycle Correction Factor (DCCF)
Duty Cycle = 5ms/100ms = 0.05, but 15.35(c) restricts duty cycle to not less than 0.1.
Duty Cycle Correction Factor (DCCF) = 20 x Log (0.1) = 20 dB
Average Limit = 113.3 –20 dBc –20 dB = 73.3 dBuV/m
Average = 40.6 + 32.1 (Correction Factor) -20 dB = 52.7 dBuV/m

PEAK Complies
Limit = -20 dBc = 113.3 –20 = 93.3 dBuV/m
Peak = 51.7.0 + 32.1 (Correction Factor) = 83.8 dBuV/m

Hopping

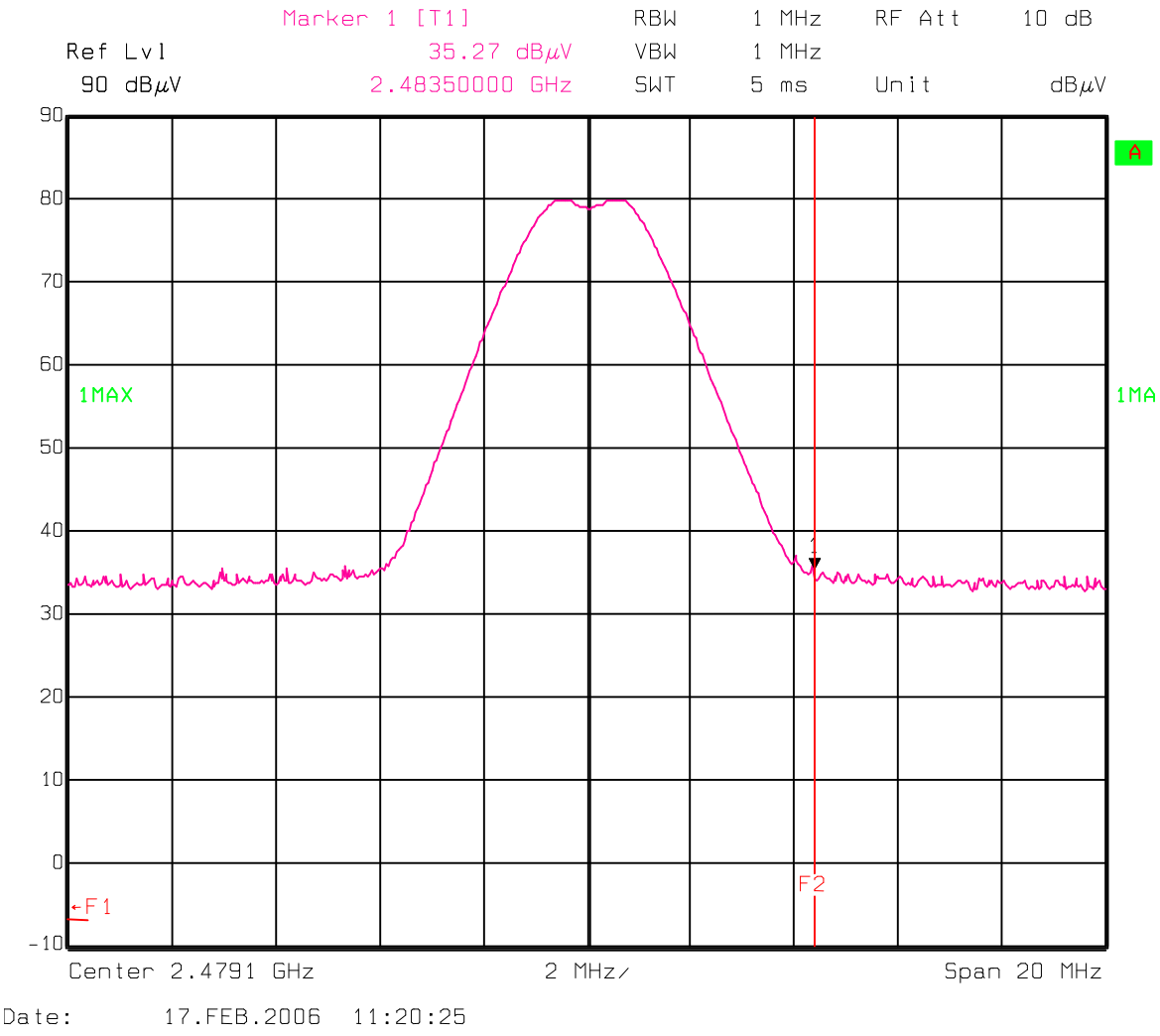


Average Complies
Average Limit = 113.3 –20 dBc –20 dB = 73.3 dBuV/m
Average = 51.7 + 32.1 (Correction Factor) -20 dB = 63.8 dBuV/m

Upper Band Edge

PEAK Complies
Correction factor for cable loss and antenna factor = 32.1 dB
Limit = 74 dBuV/m due to 15.205 restricted band and 15.209
Peak = 35.3 + 32.1 (Correction Factor) = 67.4 dBuV/m

Not Hopping

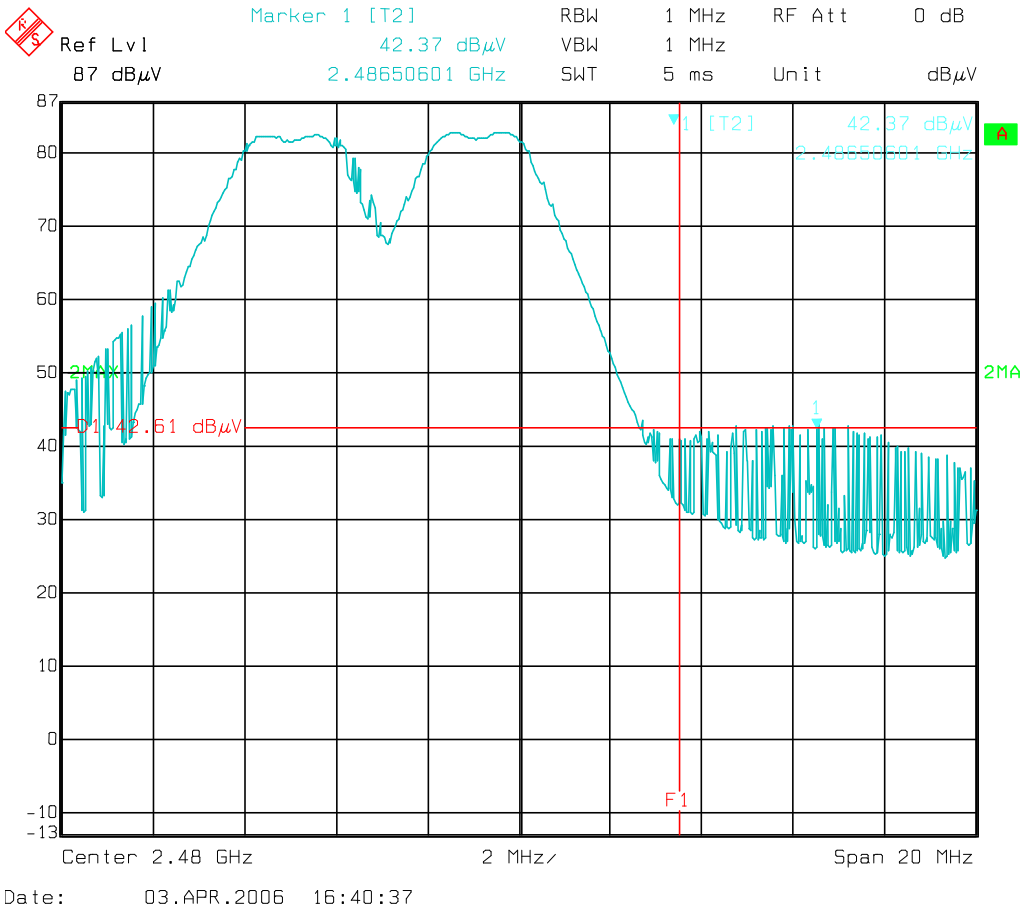


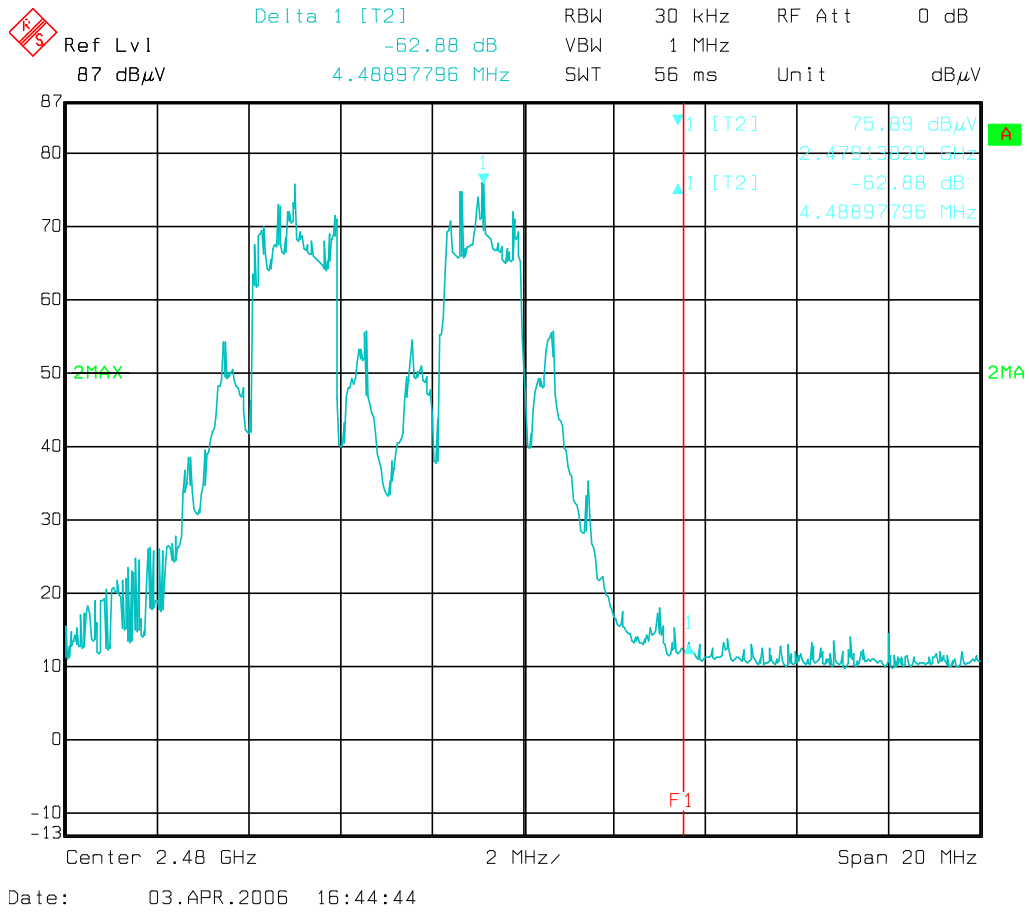
Average Complies
Average Limit = Peak – 20 dBc – Duty Cycle Correction Factor (DCCF)
Duty Cycle = 5ms/100ms = 0.05, but 15.35(c) restricts duty cycle to not less than 0.1.
Duty Cycle Correction Factor (DCCF) = 20 x Log (0.1) = 20 dB
Average Limit = 44 dBuV/m due to 15.205 restricted band and 15.209.
Average = 15.3 + 32.1 (Correction Factor) -20 dB (DCCF) = 31.8 dBuV/m

Upper Band Edge

PEAK Complies
Correction factor for cable loss and antenna factor = 32.1 dB
Limit = 74 dBuV/m due to 15.205 restricted band and 15.209
Peak = 42.4 + 32.1 (Correction Factor) = 74.5 dBuV/m which is over limit.
Applying the Marker Delta method. Next Page

Hopping





Continued
Applying Marker Delta
Emission at 1 MHz = 81.4 dBuV/m
Therefore
81.4 – 62.8 = 18.6 dBuV/m so EUT Complies Peak and Average

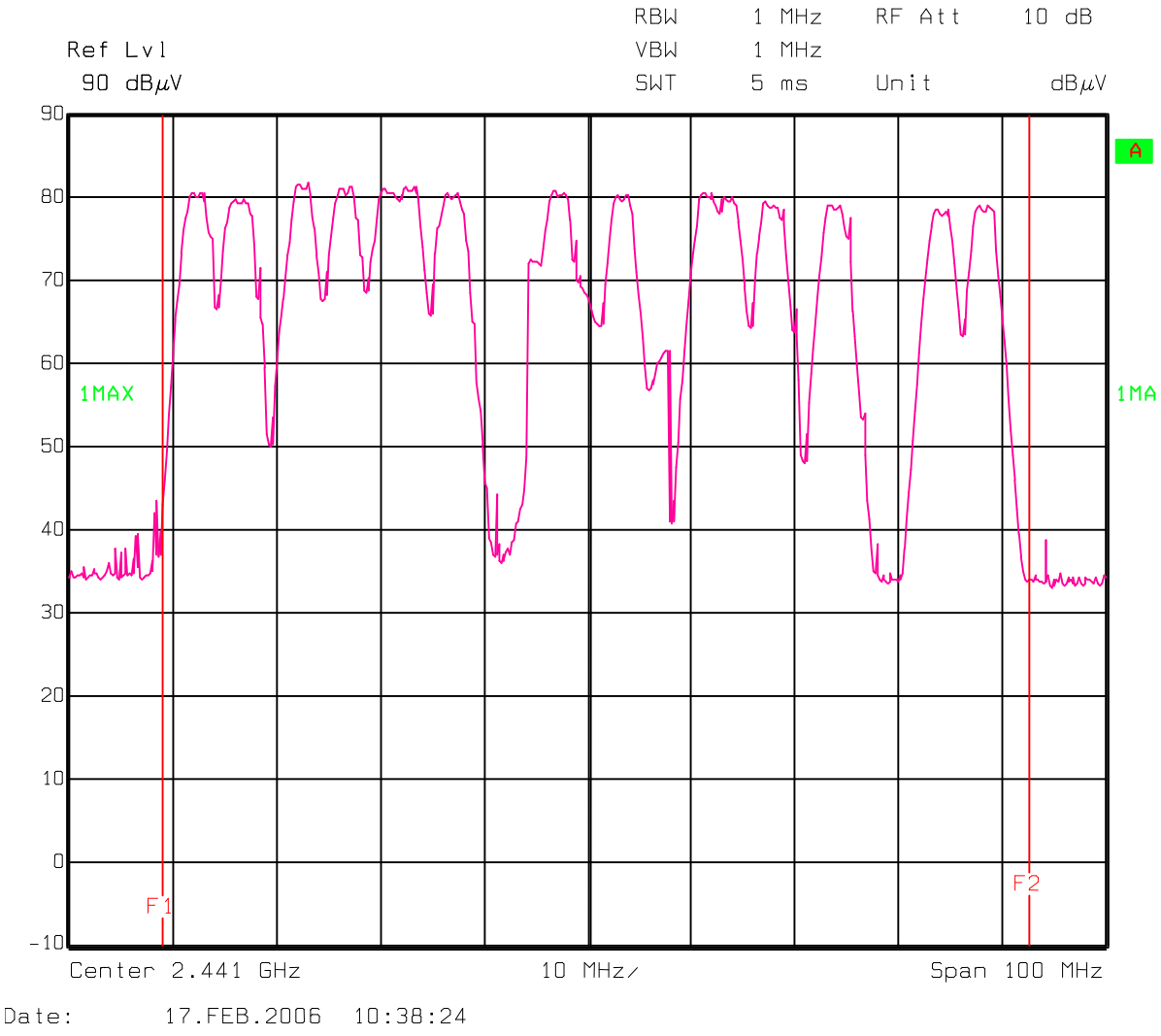
5.7. Number of Hopping Channels

RSS-210 Annex 8.1(4)

(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

At least 15 hopping channels – 15 counted.

Span = 2479.1 MHz – 2403.5 MHz = 75.6 MHz > 75 MHz



5.8. Channel Separation

15.247 (a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Frequency Separation: 2.474 MHz

(display line is an arbitrary line to provide measurement at similar points of two adjoining channels)

5.9. Time of Occupancy

RSS-210 Annex 8.1(4)

15.247 (a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

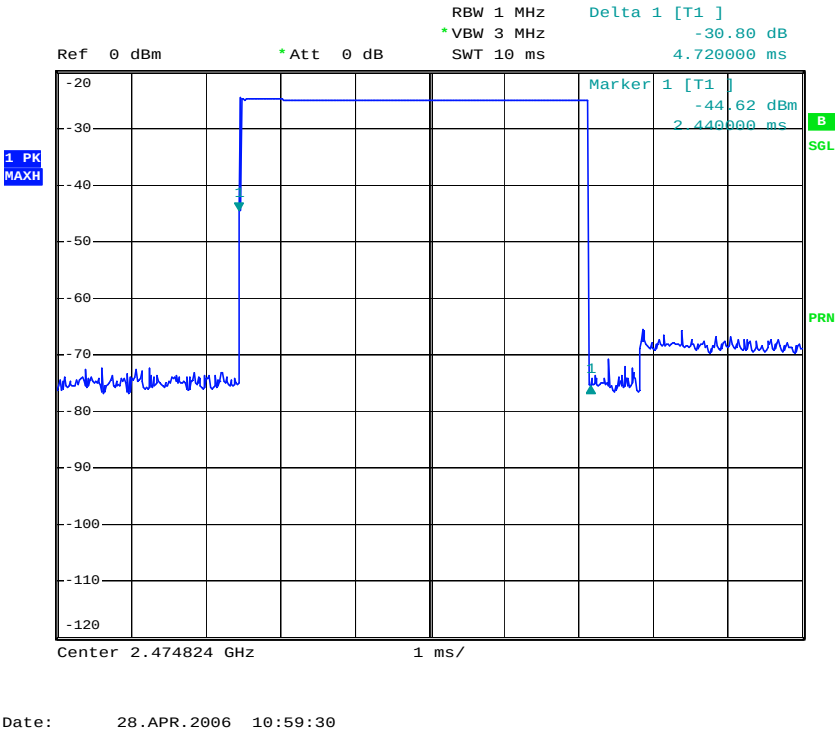
15 channels x 0.4 Seconds = 6 seconds.

4.72 ms on time each time emission is on in channel selected at random.

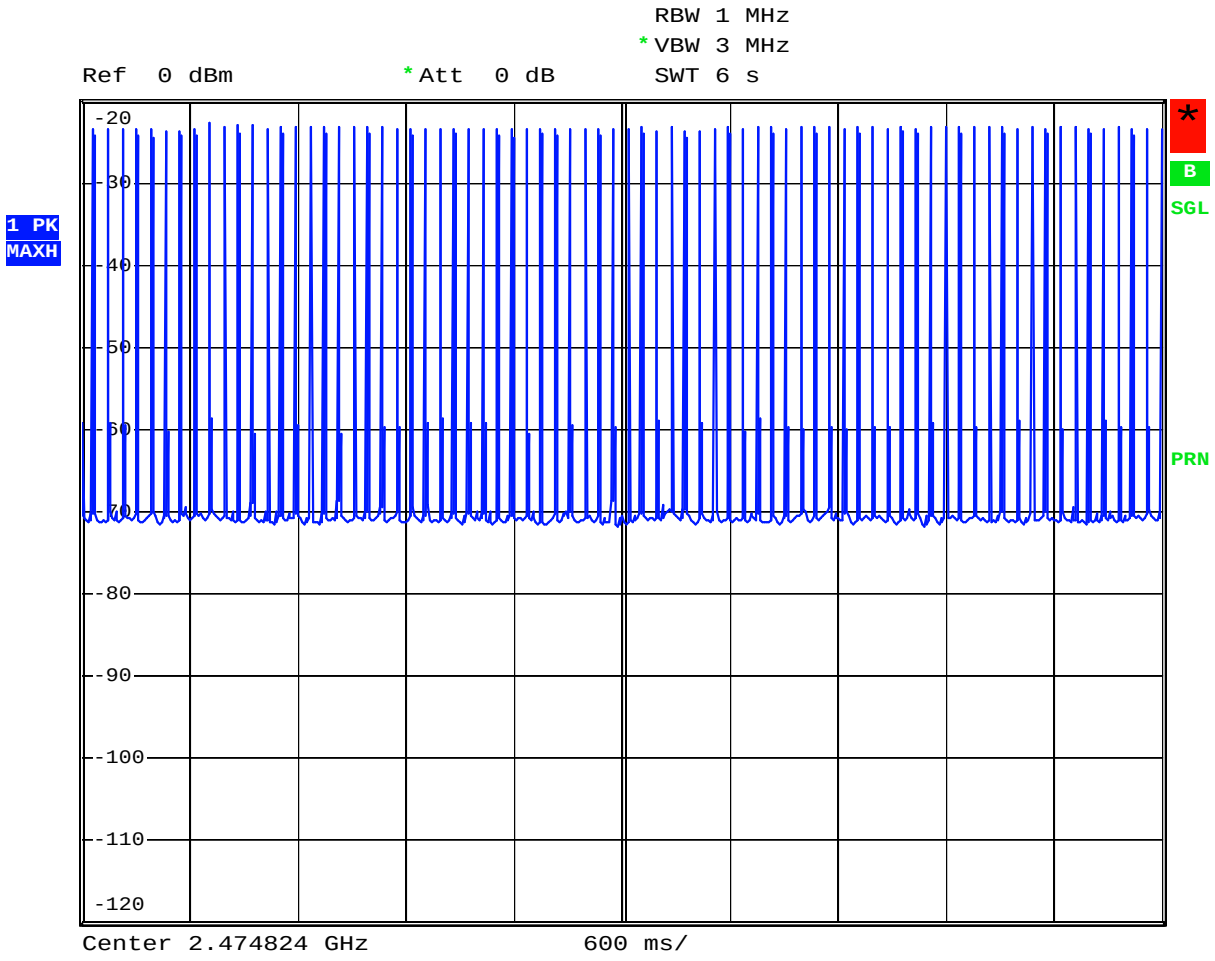
75 count for channel emission in 6 seconds – next page.

75 x 4.72 ms = 354 ms

354 ms < 0.4 seconds



Count 75 Channel Emissions in 6 seconds.



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Radiated Emissions Test Equipment

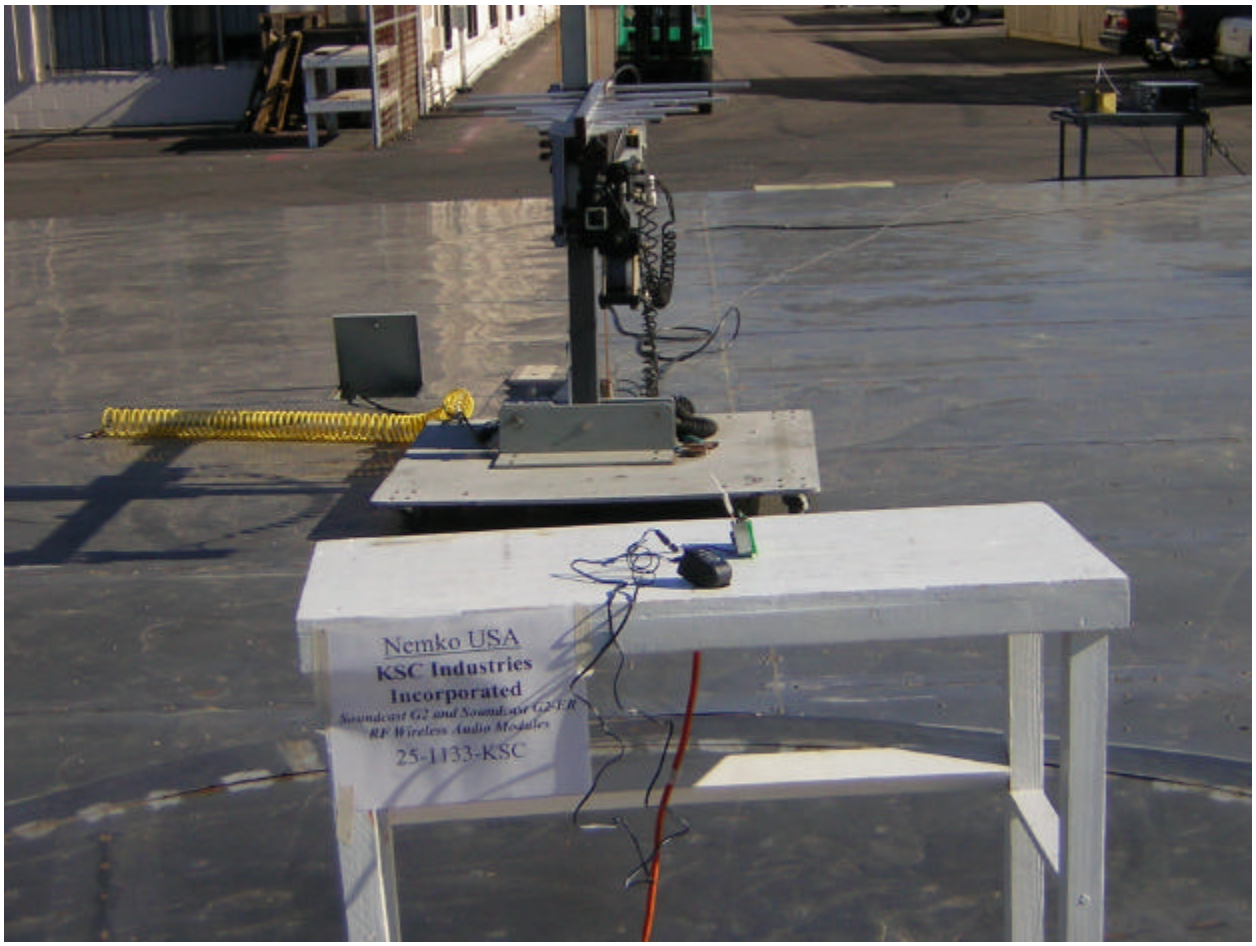
Client	**KSC Industries Incorporated**	EUT Name	SoundCast
PAN #	25-1133-KSC	EUT Model	SCG2

Asset Number	Description	Model Number	Serial Number	Last Cal	Cal Due
835	Spectrum Analyzer, Rhode & Schwarz	RHDFSEK	829058/005	12/30/05	12/30/06
529	Antenna, DRWG, EMCO	3115	2505	4/13/05	4/13/06
317	Preamplifier, HP	8449A	2749A00167	3/6/05	3/6/06
111	K&L 2500 MHz High Pass Filter	9SH10	55	3/6/05	3/6/06
625	Antenna, Dbl Ridge Horn, EMCO	3116	2325	2/3/06	2/3/07

6. Set up Photos

Conductive Emissions

Un-intentional Emissions (with power supply)



Module on Variable power supply for 15.247

APPENDIX A

A. Conducted & Radiated Emissions Measurement Uncertainties

1. Introduction

ISO Standard 17025 and ANSI/NCSL Z540-1(1994) require that all measurements contained in a test report be "traceable". "Traceability" is defined in the *International Vocabulary of Basic and General Terms in Metrology* (ISO: 1993) as: "the property of the result of a measurement... whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons, *all having stated uncertainties*".

The purposes of this Appendix are to "state the *Measurement Uncertainties*" of the conducted emissions and radiated emissions measurements contained in Section 5 of this Test Report, and to provide a practical explanation of the meaning of these measurement uncertainties.

2. Statement of the Worst-Case Measurement Uncertainties for the Conducted and Radiated Emissions Measurements Contained in This Test Report

Table 1: Worst-Case Expanded Uncertainty "U" of Measurement for a k=2 Coverage Factor

Conducted Emissions Measurement Detection Systems	**Applicable Frequency Range**	**"U" for a k=2 Coverage Factor**
HP8568B Spectrum Analyzer with QPA and HP8447F Preamplifier	150 kHz - 30 MHz	+/- 3.0 dB
HP8566B Spectrum Analyzer with QPA and Preselector	9 kHz - 30 MHz	+/- 2.9 dB
Radiated Emissions Measurement Detection Systems	**Applicable Frequency Range**	**"U" for a k=2 Coverage Factor**
HP8568B Spectrum Analyzer with QPA & HP8447F Preamplifier	30 MHz - 200 MHz	+4.0 dB, -4.1 dB
HP8568B Spectrum Analyzer with QPA & HP8447F Preamplifier	200 MHz-1000 MHz	+/- 3.5 dB
HP8566B Spectrum Analyzer with QPA & Preselector	30 MHz - 200 MHz	+3.9 dB, -4.0 dB
HP8566B Spectrum Analyzer with QPA & Preselector	200 MHz-1000 MHz	+/- 3.4 dB
HP8566B Spectrum Analyzer with QPA & HP 8449A Preamplifier	1 GHz - 18 GHz	+2.5 dB, -2.6 dB
HP8566B Spectrum Analyzer with QPA & HP8449A Preamplifier	18 GHz - 40 GHz	+/- 3.4 dB

NOTES:
1. Applies to 3 and 10 meter measurement distances
2. Applies to all valid combinations of Transducers (i.e. LISNs, Line Voltage Probes, and Antennas, as appropriate)
3. Excludes the Repeatability of the EUT

3. Practical Explanation of the Meaning of the Conducted and Radiated Emissions Measurement Uncertainties

In general, a "Statement of Measurement Uncertainty" means that with a certain (specified) confidence level, the "true" value of a measurand will be between a (stated) upper bound and a (stated) lower bound.

In the specific case of EMC Measurements in this test report, the measurement uncertainties of the conducted emissions measurements and the radiated emissions measurements have been calculated in accordance with the method detailed in the following documents:

- *ISO Guide to the Expression of Uncertainty in Measurement* (ISO, 1993)
- NIS 81:1994, *The Treatment of Uncertainty in EMC Measurements* (NAMAS, 1994)
- NIST Technical Note 1297(1994), *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results* (NIST, 1994)

The calculation method used in these documents requires that the stated uncertainty of the measurements be expressed as *an "expanded uncertainty", U, with a k=2 coverage factor*. The practical interpretation of this method of expressing measurement uncertainty is shown in the following example:

EXAMPLE: Assume that at 39.51 MHz, the (measured) radiated emissions level was equal to +26.5 dBuV/m, and that the +/- 2 standard deviations (i.e. 95% confidence level) measurement uncertainty was +/- 3.4 dB.

In the example above, the phrase "k = 2 Coverage Factor" simply means that the measurement uncertainty is stated to cover +/-2 standard deviations (i.e. a 95% confidence interval) about the measurand. The measurand is the radiated emissions measurement of +26.5 dBuV/m at 39.51 MHz, and the 95% bounds for the uncertainty are –3.4 dB to + 3.4 dB. One can thus be 95% confident that the "true" value of the radiated emissions measurement is between +23.1 dBuV/m and +29.5 dBuV/m. *In effect, this means that in the above example there is only a 2.5% chance that the "true" radiated emissions value exceeds +29.5 dBuV/m.*

APPENDIX B

B. Nemko USA, Inc.'s Test Equipment & Facilities Calibration Program

Nemko USA, Inc. operates a comprehensive Periodic Calibration Program in order to ensure the validity of all test data. Nemko USA's Periodic Calibration Program is fully compliant to the requirements of NVLAP Policy Guide PG-1-1988, ANSI/NCSL Z540-1 (1994), ISO 10012-1 (1993-05-01), ISO Standard 17025, ISO-9000 and EN 45001. Nemko USA, Inc.'s calibrations program therefore meets or exceed the US national commercial and military requirements [N.B. ANSI/NCSL Z540-1 (1994) replaces MIL-STD-45662A].

Specifically, all of Nemko USA's *primary reference standard devices* (e.g. vector voltmeters, multimeters, attenuators and terminations, RF power meters and their detector heads, oscilloscope mainframes and plug-ins, spectrum analyzers, RF preselectors, quasi-peak adapters, interference analyzers, impulse generators, signal generators and pulse/function generators, field-strength meters and their detector heads, etc.) and certain *secondary standard devices* (e.g. RF Preamplifiers used in CISPR 11/22 and FCC Part 15/18 tests) are periodically recalibrated by:

- A Nemko USA-approved independent (third party) metrology laboratory that uses NIST-traceable standards and that is ISO Guide 25-accredited as a calibration laboratories by NIST; or,
- A Nemko USA-approved independent (third party) metrology laboratory that uses NIST-traceable standards and that is ISO Guide 25-accredited as a calibration laboratory by another accreditation body (such as A2LA) that is mutually recognized by NIST; or,
- A manufacturer of Measurement and Test Equipment (M&TE), if the manufacturer uses NIST-traceable standards and is ISO Guide 25-accredited as calibration laboratory either by NIST or by another accreditation body (such as A2LA) that is mutually recognized by NIST; or
- A manufacturer of M&TE (or by a Nemko USA-approved independent third party metrology laboratory) that is not ISO Guide 25-accredited. (In these cases, Nemko USA conducts an annual audit of the manufacturer or metrology laboratory for the purposes of proving traceabilty to NIST, ensuring that adequate and repeatable calibration procedures are being applied, and verifying conformity with the other requirements of ISO Guide 25).

In all cases, the entity performing the Calibration is required to furnish Nemko USA with a calibration test report and/or certificate of calibration, and a "calibration sticker" on each item of M&TE that is successfully calibrated.

Calibration intervals are normally one year, except when the manufacture advises a shorter interval (e.g. the HP 8568B Spectrum Analyzer is recalibrated every six months) or if US Government directives or client requirements demand a shorter interval. Items of instrumentation/related equipment which fail during routine use, or which suffer visible mechanical damage (during use or while in transit), are sidelined pending repair and recalibration. (Repairs are carried out either in-house [if minor] or by a Nemko USA-approved independent [third party] metrology laboratory, or by the manufacturer of the item of M&TE).

Each antenna used for CISPR 11 and CISPR 22 and FCC Part 15 and Part 18 radiated emissions testing (and for testing to the equivalent European Norms) is calibrated annually by either a NIST (or A2LA) ISO Standard 17025-Accredited third-party Antenna Calibration Laboratory or by the antenna's OEM if the OEM is NIST or A2LA ISO Standard 17025-accredited as an antenna calibration laboratory. The antenna calibrations are performed using the methods specified in Annex G.5 of CISPR 16-1(1993) or ANSI C63.5-1991, including the "Three-Antenna Method". Certain other kinds of antennas (e.g. magnetic-shielded loop antennas) are calibrated annually by either a NIST (or A2LA) ISO Standard 17025-accredited third-party antenna calibration laboratory, or by the antenna's OEM if the OEM is NIST or A2LA ISO Standard 17025-accredited as an antenna calibration laboratory using the procedures specified in the latest version of SAE ARP-958.

In accordance with FCC and other regulations, Nemko USA recalibrates its suite of antennas used for radiated emissions tests on an annual basis. These calibrations are performed as a precursor to the FCC-required annual revalidation of the Normalized Site Attenuation properties of Nemko USA's Open Area Test Site. Nemko USA, Inc. uses the procedures given in both Subclause 16.6 and Annex G.2 of CISPR 16-1 (1993), and, ANSI C63.4-2003 when performing the normalized site attenuation measurements.