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PART 15.247

TEST REPORT

For The **2.4 GHz System**

Model: IP-LinK 1220-2133

FCC ID# RF2IPLINKP220.

PREPARED FOR:

Helicomm
1947 Camino Vida Roble, Suite 109
Carlsbad, CA 92008

PREPARED ON SEPTEMBER 30, 2005

REPORT NUMBER 2005 090314R1-FCC

PROJECT NUMBER: 25-314-HELR1

Number of Pages: 26

DOCUMENT HISTORY

REVISION	DATE	COMMENTS
-	September 30, 2005	Prepared By: Alan Laudani
-	December 17, 2004	Initial Release: F.R. 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 September 28, 2005 . Testing was performed on the unit described in this report on September 28, 2005 to September 29, 2005
- 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.

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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 "**A**" 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

Floyd Fleury
Frontline Manager

1. ADMINISTRATIVE DATA AND TEST SUMMARY

Administrative Data

CLIENT:	**Helicomm** **1947 Camino Vida Roble, Suite 109** **Carlsbad, CA 92008** **760-918-0856**
CONTACT:	**Leon Gateno**
DATE (S) OF TEST:	September 28, 2005 to September 29, 2005
EQUIPMENT UNDER TEST (EUT):	**2.4 GHz System**
Model	IP-LinK 1220-2133
Condition Upon Receipt	Suitable for Test
TEST SPECIFICATION:	FCC, Part 15.247

Test Summary

Specification	***Frequency Range***	***Compliance Status***
FCC, CFR 47, Section 15.107 Class "B" Conducted Emissions	0.150 MHz - 30.00 MHz	**N/A***
FCC, CFR 47, Section 15.209 Class "B" Radiated Emissions	30 MHz - 24850 MHz	**PASS**
FCC, CFR 47, Section 15.247	2405—2480 MHz	**PASS**

- *Not applicable as EUT is DC powered by a battery.

Test Supervisor: FR Fleury
Chip Fleury, Nemko USA, Inc.

Refer to the test results section for further details.

2.SYSTEM CONFIGURATION

Description and Method of Exercising the EUT

The C1 is a **2.4 GHz System**. Its function is to be a module for digital communication as installed per the proposed installation manual for FCC Part 15.247. The EUT was exercised by the test fixture, programmed for continuous modulated operation for low, mid and highest frequencies to facilitate FCC RF testing. The IPLINK1220 is designed to meet the IEEE802.15.4 standard. As a result the individual channels are wide bandwidth. Hence, the IPLINK1220 does not require operator tuning.

System Components and Power Cables

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT - **2.4 GHz System**	**Helicomm** IP-Link 1220-2233 Serial #: NA	N/A
EUT Test Fixture	**Helicomm** Model # NA Serial # NA	N/A

Device Interconnection and I/O Cables

CONNECTION	I/O CABLE
No connections	

Design Modifications for Compliance

Device: **2.4 GHz System**

Model: IP-Link 1220-2133

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

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

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.

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.

For Conducted Emissions Test Configuration please refer to Figure 2 on the following page.

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.

For Frequency ID Test Configuration please refer to Figure 3 on the following page.

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-1

Example Frequency = 110MHz
18.5 dBuV (spectrum analyzer reading)
+3.0 dB (cable loss @ frequency)
21.5 dBuV
+15.4 dBm-1 (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.

5. TEST RESULTS

Test results are shown for the C1 with the additional power amplifier.
Intended to operated under 15.247 for direct sequence spread spectrum systems, the device complies for having a 6 dB bandwidth greater than 500 kHz (para. A-2), power output of less than 1/8 watt (para. B-1), peak power density of less than 8 dBm (measured by radiated means—para. D), and meets the requirements of the 15.205 restricted bands for spurious emissions (para. C).

Highest power level @ 2405 MHz was 101.7 dBuV/m (page 25) with increased bandwidth which is equal to a EIRP of 4.4 mW or 6.5 dBm.

a. $10^{[(\text{Field Strength in dBuV/m} - 120)/20]}$ = Field Strength in V/m
b. $[(\text{Field Strength in V/m} \times 3\text{m})/5.48]^2$ = Power in Watts 0.0044 W
c. 10 x log (Power in Wattts) + 30 = dBm
d. If 1 is put in for field strength, result is –94.3 dBm, difference of 95.3 results as conversion factor.

Input power was varied by ±15%, RF power did not vary with voltage change.
Measurements were made using a fresh battery for the test fixture.

Power density:

Maximized emission with rotation and antenna height.
RBW 1 MHz, VBW 1MHz
Vertical and horizontal peak
Reset VBW to 3 kHz, auto sweep.
Located max peak with peak search, centered in span, set to zero san.
Report frequency found.
Maximized Field strength measurement in dBuV/m + CF - 95.3 dBm/dBuV/m=
Result in dBm.(antenna gain is included as it is a Radiated Measurement)
Compare to limit of 8 dBm.

Radiated Emissions Test Data

IP-Link 1220-2133

Emissions were investigated from 30 MHz to 25000 MHz
No emissions found from 30 to 2400 MHz, no other emissions found other than noted below.

Radiated Emissions Data

Complete	YES			Job # :	25-314-HELR1	Test # :	1
Preliminary				Page	1	of	1
Client Name :	Helicomm						
EUT Name :	2.4 GHz System						
EUT Model # :	C1a						
EUT ANTENNA Part # :	Integral donut						
EUT Serial # :							
EUT Config. :	Transmit						
Specification :	FCC Part 15.247C, 15.209, 15.205(a)			Reference :			
Rod. Ant. #:	NA	Temp. (deg. C) :	26	Date :	9/28/2005		
Bicon Ant.#:	NA	Humidity (%) :	23	Time :			
Log Ant.#:	NA	EUT Voltage :	9	Staff :	A. L.		
DRG Ant. #	529	EUT Frequency :	dc	Photo ID:			
Dipole Ant.#:	NA	Phase:	na	Peak Res Bandwidth:	1 MHz		
Cable#:	40ft	Location:	SOATS	Peak Video Bandwidth	1 MHz		
Preamp#:	842	Distance:	3M	AVE Res Bandwidth:	1 MHz		
Spec An.#:	NA			AVE Video Bandwidth	10 Hz		
QP #:	NA	Duty cycle factor	-10.50				
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
2405.0	68.1		66.3		33.4	101.5		125.3		-23.8		60	1.1	Pass	
4810.0	57.9	47.4	66.0	55.5	-5.4	60.6	50.1	74.0	54.0	-13.4	-3.9	60	1.0	Pass	duty cycle average
2440.0	65.3		67.8		32.1	99.9		125.3		-25.4		45	1.2	Pass	
4880.0	57.5	47.0	66.0	55.5	-5.4	60.6	50.1	74.0	54.0	-13.4	-3.9	45	1.2	Pass	duty cycle average
2480.0	63.9		61.2		32.1	96.0	32.1	125.3		-29.3		45	1.2	Pass	
4960.0	55.5	45.0	64.3	53.8	-5.4	58.9	48.4	74.0	54.0	-15.1	-5.6	45	1.2	Pass	duty cycle average
						dBm									3 kHz peak power density
2480.7	47.5		44.7		32.1	-15.4		8.0		-23.4				Pass	
2440.4	52.6		49.9		32.1	-10.3		8.0		-18.3				Pass	
2405.2	39.8		45.1		33.4	-16.5		8.0		-24.5				Pass	

Emissions Test Equipment

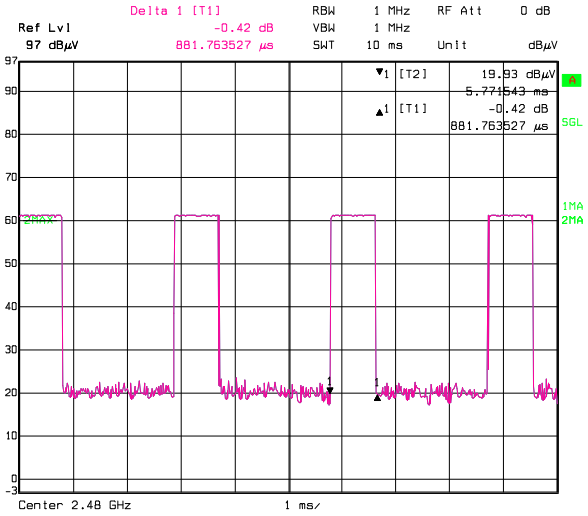
Client	**Helicomm**	EUT Name	**2.4 GHz System**
PAN #	25-314-HELR1	EUT Model	IP-Link 1220-2033 & IP-Link 1220-2233

Asset Number	Description	Model Number	Serial Number	Last Cal	Cal Due
835	Spectrum Analyzer, Rhode & Schwartz	RHDFSEK	829058/005	12/30/04	12/30/05
842	Preamp	Nemko	na	5/19/05	verified
529	Antenna, DRWG, EMCO	3115	2505	4/13/05	4/13/06
110	Antenna, LPA, Electrometrics	LPA-25	1217	10/4/04	10/4/05
114	Antenna, Bicon, EMCO	3104	2997	9/30/04	9/30/05
897	Rohde & Schwartz, Spectrum Analyzer	FSP7	837620/009	4/18/05	4/18/06

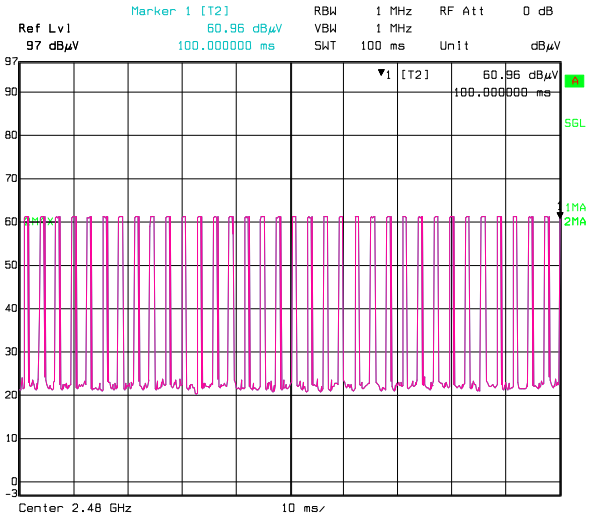
Duty Cycle Measurement

Duty cycle = 34 x 0.000882 = 0.03 seconds in 100 ms
Duty cycle = 30 % and
20 X log (0.30) = - 10.5 dB

Digital Word = 882 microseconds

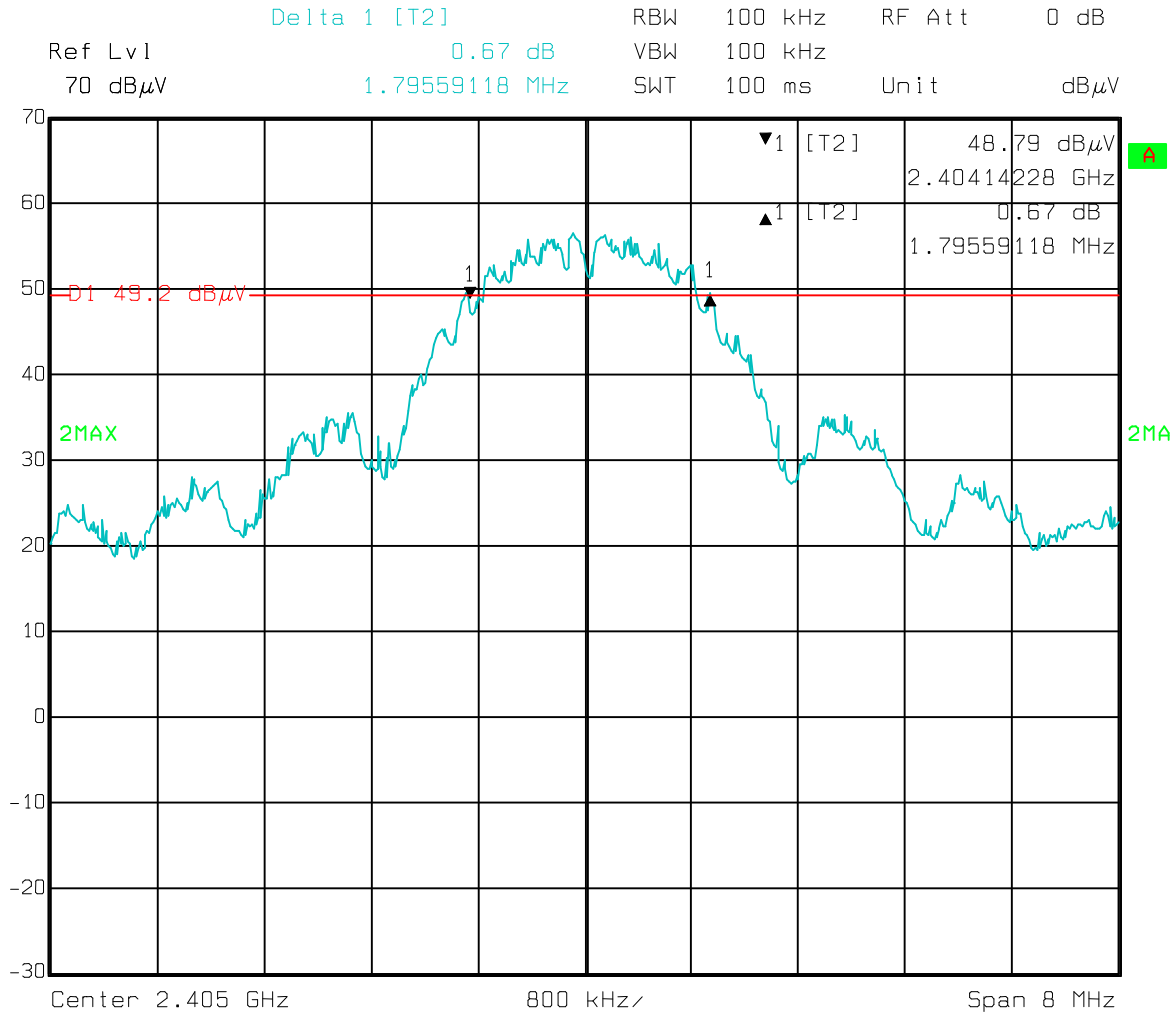


34 digital words in 100 ms

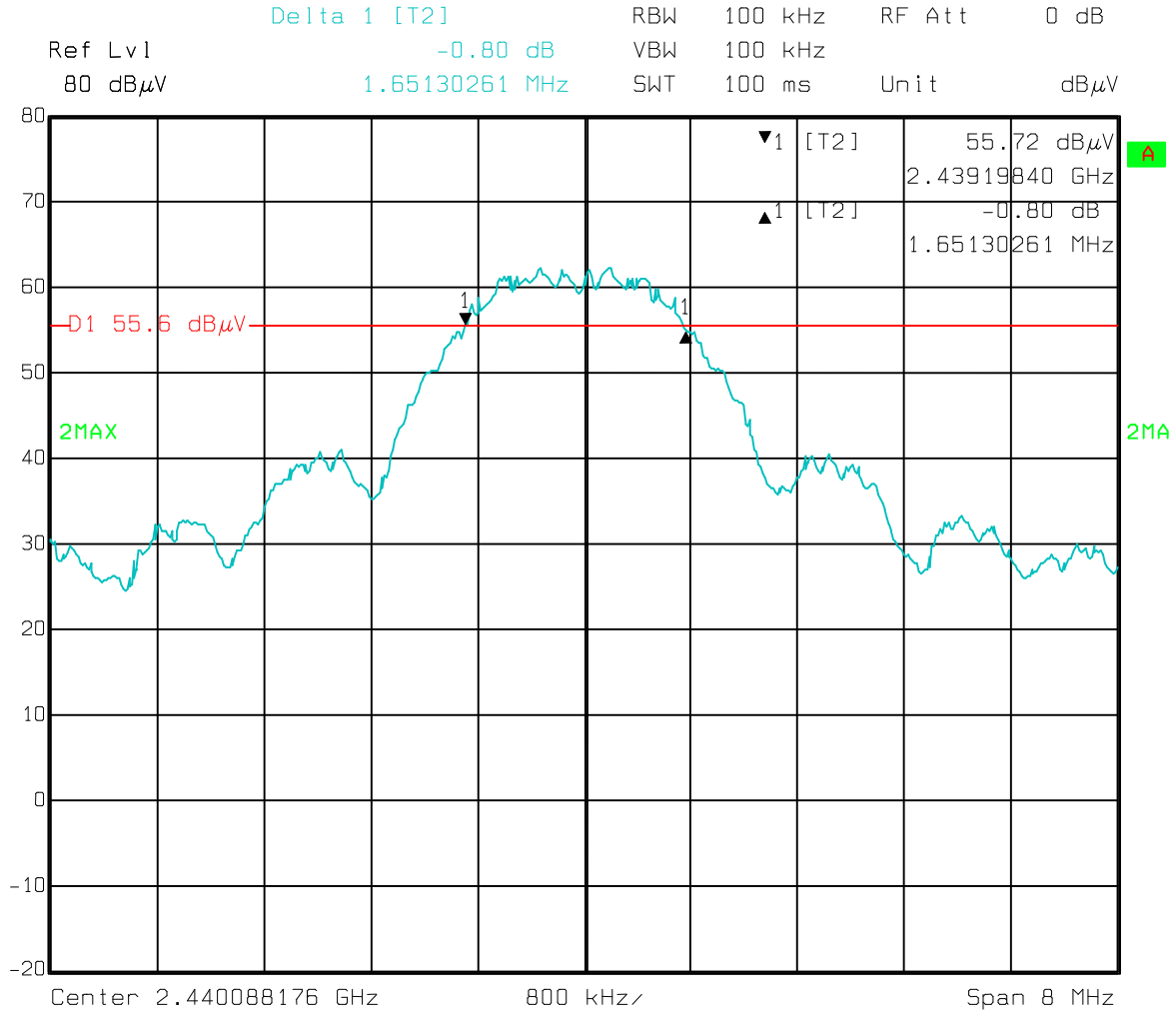


Bandwidth

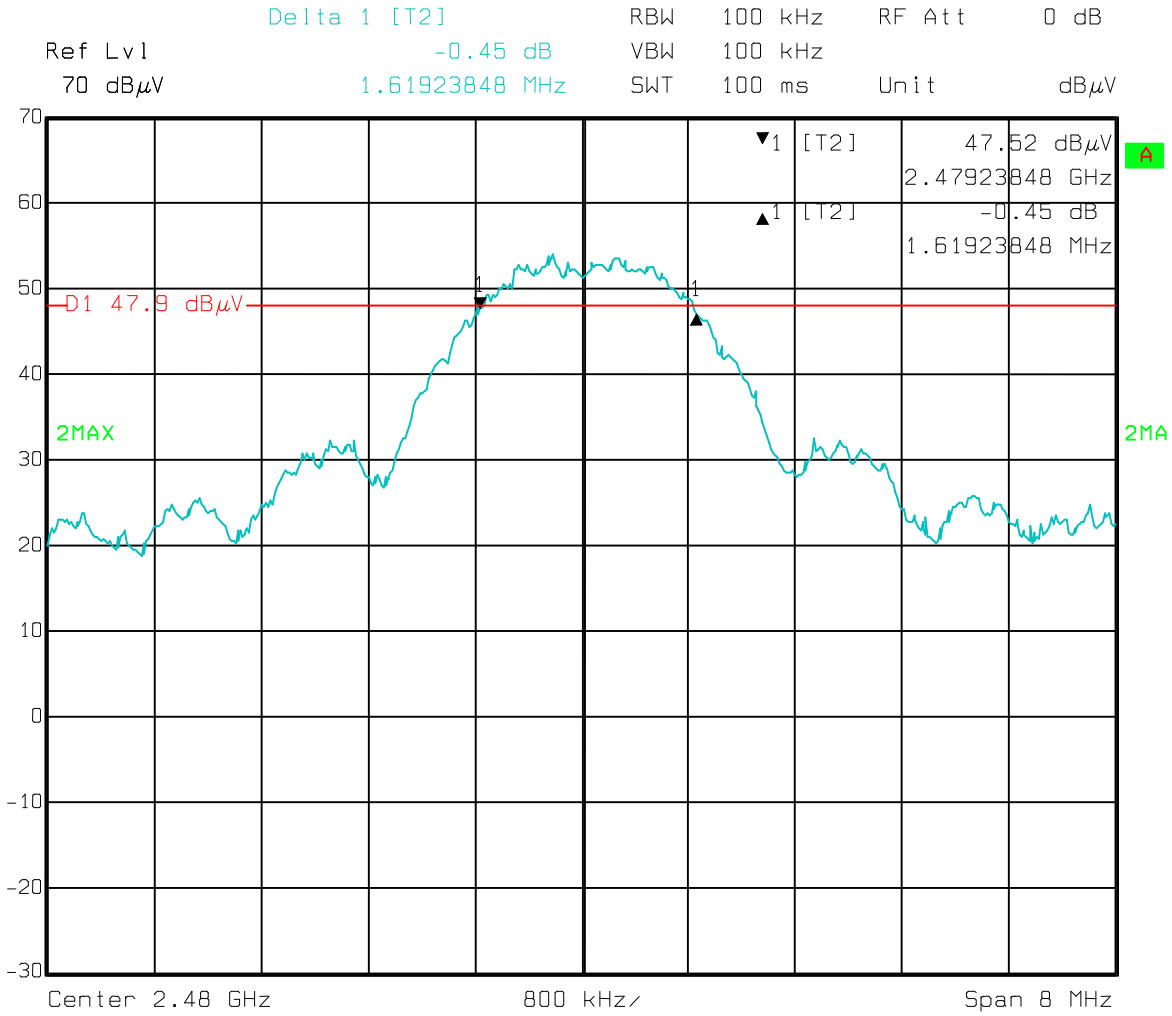
Low Frequency 2405 MHz; 6 dB Bandwidth = 1.79 MHz



Mid Frequency 2440 MHz; 6 dB Bandwidth = 1.65 MHz



High Frequency 2480 MHz; 6 dB Bandwidth = 1.62 MHz



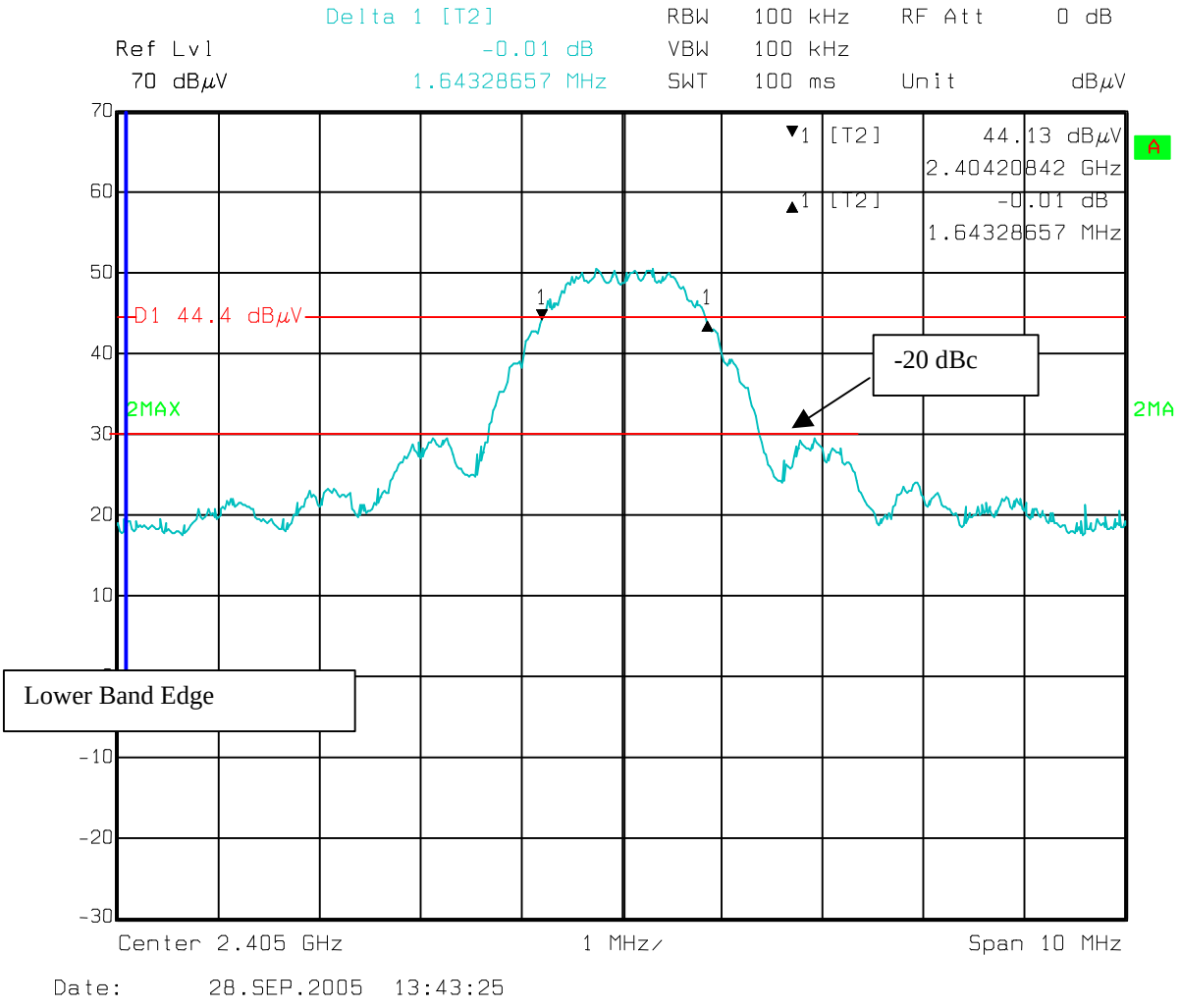
Bandedge Emissions

Low Frequency

Low Frequency Bandedge Emissions

Lower bandedge plot showing compliance to –20 dBc in 100 kHz BW

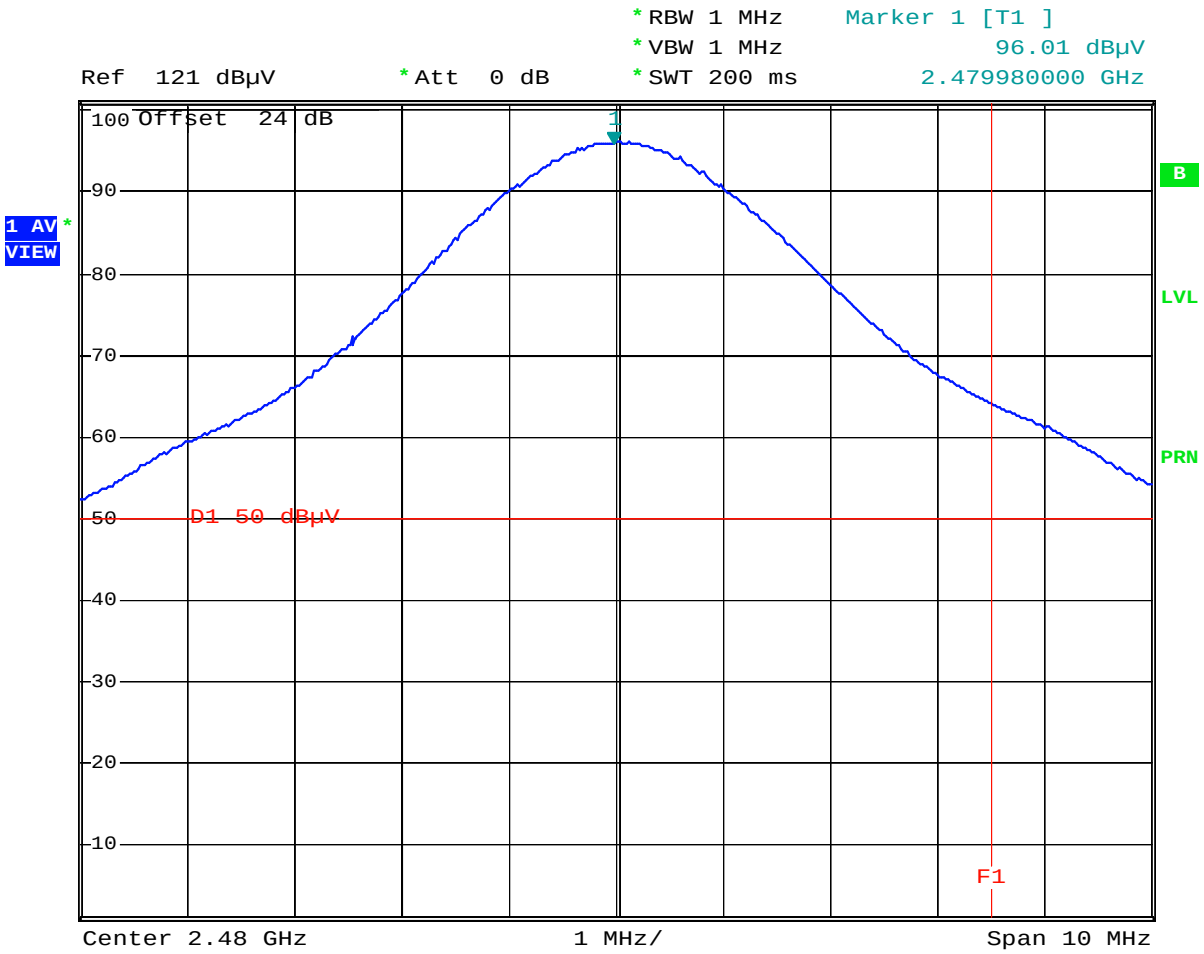
Add 8 dB reference level offset.



High Frequency Bandedge Emissions

Delta Marker Method.

Peak = 96 dBuV/m as measured on 3m site.



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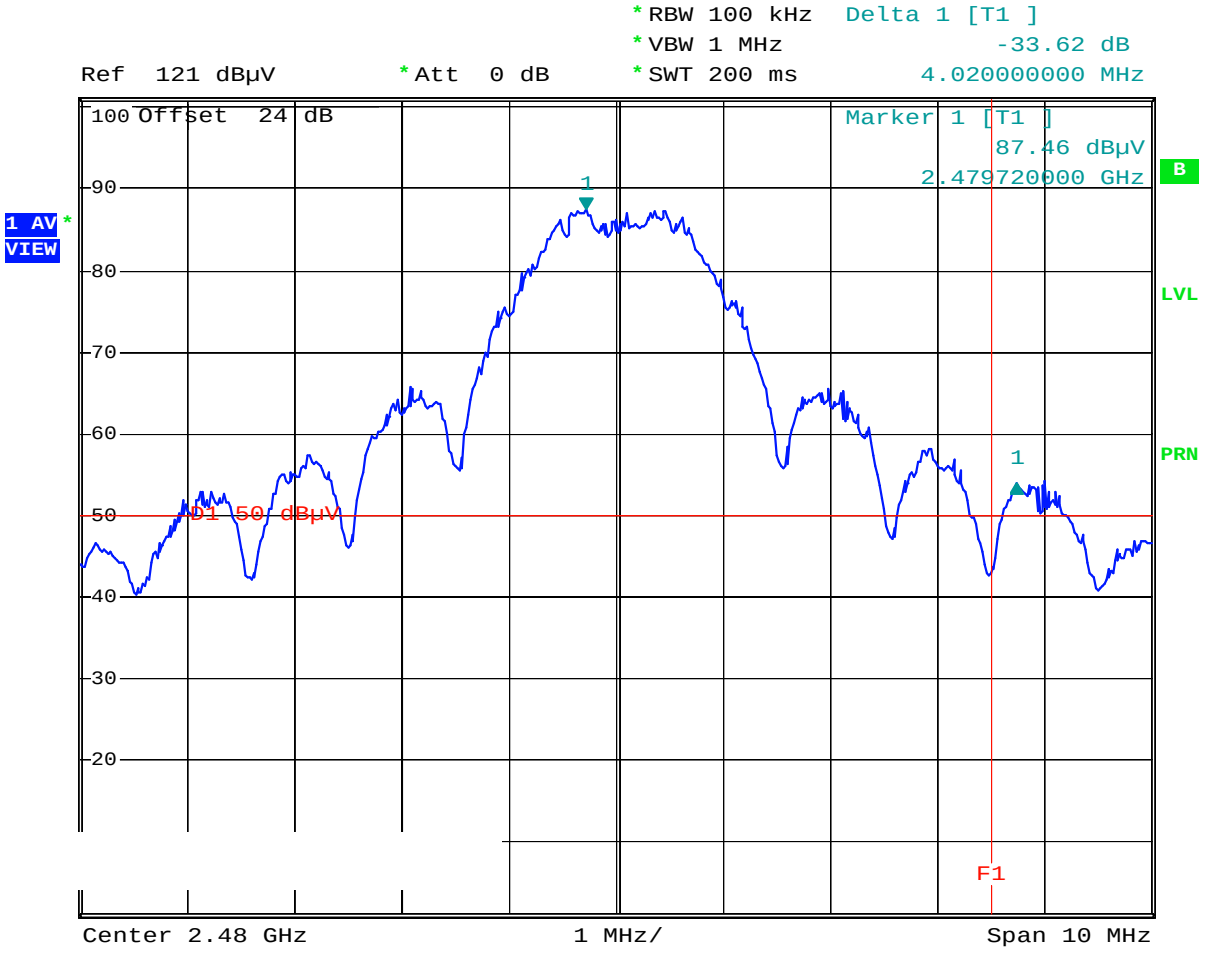
With reduced RBW, delta from Peak to Worst emission at Bandedge = 33.62

96 – 33.62 = 62.38 < 74, therefore Peak Complies.

Duty cycle factor = 10.46

62.38 – 10.46 = 51.92 therefore Average Complies



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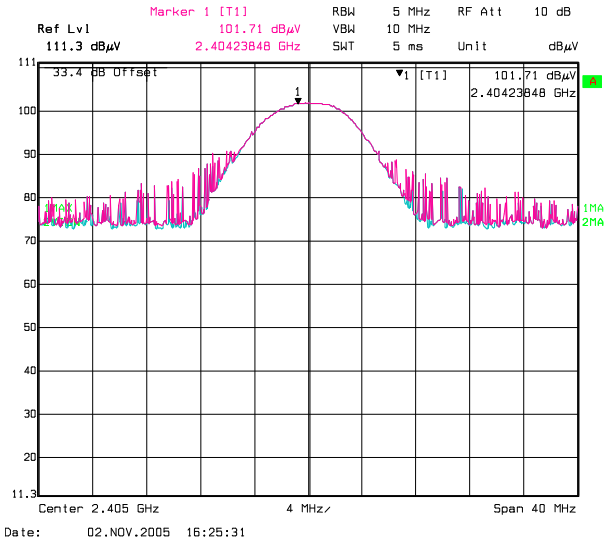
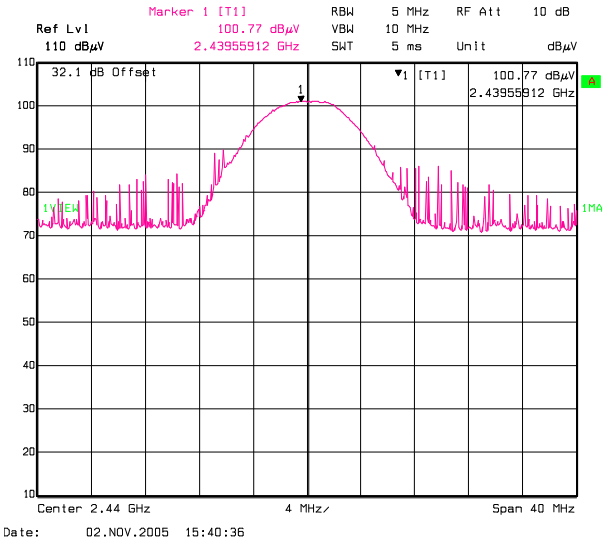
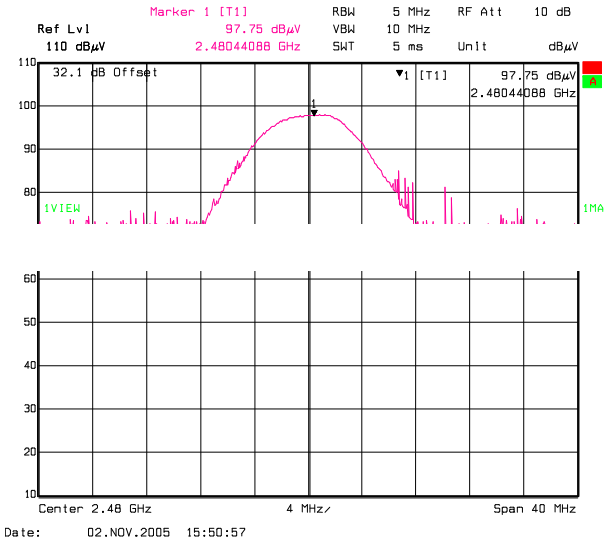
Output PowerDue to the wide bandwidth, These plots show the power level as measured at a

Resolution bandwidth of 5 MHz
2405 MHz = 101.7 dBuV/m
2440 MHz = 100.8 dBuV/m
2480 MHz = 97.8 dBuV/m







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.