***Nemko USA, Inc.***
*11696 Sorrento Valley Rd., Suite F*
*San Diego, CA 92121-1024*
*Phone (858) 755-5525  Fax (858) 452-1810*

# CERTIFICATION TEST REPORT

| | |
|---|---|
| **In Accordance With:** | FCC Part 15 Subpart C, 15.249<br>IC RSS-210 Issue 7 June 2007 |
| **Applicant:** | **AGL Corporation**<br>**2202 Redmond Road**<br>**Jacksonville, Arizona 72076** |
| **Equipment Under Test :**<br>**Model:** | **Laser Pointer/Leveling System**<br>**GP15** |
| **FCC ID:**<br>**IC:** | NR7GP15<br>5282A-GP15 |
| **Tested By:** | Nemko USA Inc.<br>11696 Sorrento Valley Road, Suite F<br>San Diego, CA 92121 |
| **Test Report:**<br>**Date:**<br>**Project number:**<br>**Nex Number:** | **2010 04147536 FCC**2<br>**September 2, 2010**<br>43561-1<br>**147536** |
| **Total Number of Pages:** | 30 |

**11696 Sorrento Valley Road, Suite F, San Diego, CA 92121**
**Phone (858) 755-5525 Fax (858) 452-1810**




# Section 1. Summary of Test Results

## General

**All measurements are traceable to national standards**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15; Subpart C. Radiated tests were conducted is accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

| | |
|---|---|
| **Apparatus Assessed:** | **Laser Pointer/Leveling System** |
| **Model:** | **GP15** |
| Works in conjunction with | |
| | **Hand Held Remote** |
| | **GP15R** |
| **Specification:** | FCC Part 15 Subpart C, 15.249<br>IC RSS-210 Issue 7 June 2007 |
| **Date Received in Laboratory:** | **April 5, 2010** |
| **Compliance Status:** | Complies |
| **Exclusions:** | None |
| **Non-compliances:** | None |

11696 Sorrento Valley Road, Suite F, San Diego, CA 92121
Phone (858) 755-5525 Fax (858) 452-1810




**Report Release History**

| REVISION | DATE | COMMENTS |
|---|---|---|
| - | **September 2, 2010** | Prepared By: Alan Laudani |
| - | **September 2, 2010** | Initial Release: Alan Laudani |

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

Nemko USA Inc. authorizes the applicant to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko USA Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

TESTED BY:  Date: **September 2, 2010**
Alan Laudani, EMC Test Engineer

11696 Sorrento Valley Road, Suite F, San Diego, CA 92121
Phone (858) 755-5525 Fax (858) 452-1810




# TABLE OF CONTENTS

11696 Sorrento Valley Road, Suite F, San Diego, CA 92121
Phone (858) 755-5525 Fax (858) 452-1810




# Section 2: Equipment Under Test

## 2.1 Product Identification

The Equipment Under Test for compliance with FCC Part 15.249 was identified as follows:

| | |
|---|---|
| EUT: | **Laser Pointer/Leveling System** |
| Model: | **GP15** |
| Serial Number: | **HG0129** |

## 2.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

| **DEVICE** | **MANUFACTURER<br>MODEL #<br>SERIAL #** | **POWER CABLE** |
|---|---|---|
| EUT – Hand Held Remote | AGL Corporation<br>Model: GP15R<br>Serial #: HG0129R | |
| EUT – Laser Pointer/Leveling System | AGL Corporation<br>Model: GP15<br>Serial #: HG0129 | 12 Vdc twin lead from charger, internal rechargeable battery |
| EUT— Battery Charger | FSP Group Inc.<br>Model: FSP024-DEEB2<br>Serial #: H00001138 | Two prong wall wart 100-240Vac Output 12V @ 2A max |

| **CONNECTION** | **I/O CABLE** |
|---|---|
| No connections | None - wireless |

**11696 Sorrento Valley Road, Suite F, San Diego, CA 92121**
**Phone (858) 755-5525 Fax (858) 452-1810**





## 2.3 Theory of Operation

**The GP15R** is a Hand Held Remote to be used as a remote control for the Laser Pointer/Leveling System, model GP15. As a handheld device, the GP15R was tested in all three axes and with the keypad activated by mechanical means to hold the button down. When the GP15R is activated and transmits, the GP15 answers, changing operation as directed and stays transmitting for about 2 minutes, relaying status to the screen of the Hand Held Remote.
The GradoPlane 15 (GP15) is a self leveling laser instrument for height measurement and surveying. A dual grade percentage of +/-10% can be entered directly and will be level automatically.

The EUT's performance during test was evaluated against the performance criterion specified by applicable test standards. Performance results are detailed in the test results section of this report.

## 2.4 Technical Specifications of the EUT

| | |
|---|---|
| **Manufacturer:** | AGL Corporation |
| **Operating Frequency:** | 916.6 to 919.6 MHz in the 902 to 928 MHz Band |
| **Number of Operating Frequencies:** | 16 |
| **Measured Field Strength:** | 90.0 dBµV/m at 3m<br>or 32 mV/m |
| **Modulation:** | GFSK |
| **Emissions Designator:** | 220KF1D |
| **Antenna Data:** | Soldered onto circuit board |
| **Antenna Connector:** | None |
| **Power Source:** | Internal rechargeable batteries.<br>12 Vdc with 100-240 Vac charger |

**11696 Sorrento Valley Road, Suite F, San Diego, CA 92121**
**Phone (858) 755-5525 Fax (858) 452-1810**





# Section 3: Test Conditions

## 3.1 Specifications

The apparatus was assessed against the following specifications:

***FCC Part 15 Subpart C, 15.249***
Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0-24.25 GHz bands.

***IC RSS-210 Issue 7 June 2007***
Low-power Licence-exempt Radio-communication Devices (All Frequency Bands): Category I Equipment. Annex 8 - Frequency Hopping and Digital Modulation Systems Operating in the Bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

***IC RSS-Gen Issue 2 June 2007***
General Requirements and Information for the Certification of Radio-communication Equipment

## 3.2 Deviations From Laboratory Test Procedures

No deviations from Laboratory Test Procedure

## 3.3 Test Environment

All tests were performed under the following environmental conditions:

| | |
|---|---|
| Temperature range | 16 – 22 $^{o}$C |
| Humidity range | 40-66 % |
| Pressure range | 86 - 106 kPa |

## 3.4 Test Equipment

| Nemko ID | Device | Manufacturer | Model | Serial Number | Cal Date | Cal Due Date |
|---|---|---|---|---|---|---|
| 110 | Antenna, LPA | Electrometrics | LPA-25 | 1217 | 1/10/2009 | 2/10/2011 |
| 114 | Antenna, Bicon | EMCO | 3110 | 2997 | 3/5/2010 | 3/5/2012 |
| 317 | Preamplifier | HP | 8449A | 2749A00167 | 6/16/2009 | 6/16/2010 |
| 911 | Spectrum Analyzer | Agilent | E4440A | US41421266 | 12/17/2009 | 12/17/2010 |
| 877 | Antenna, DRG Horn, .7-18GHz | AH Systems | SAS-571 | 688 | 7/28/2008 | 7/28/2010 |
| 898 | EMI Receiver & filter set | HP | 8546A | 3625A00348 | 5/31/2009 | 5/31/2010 |
| 899 | Filter Section | HP | 85460A | 3448A00288 | 5/31/2009 | 5/31/2010 |
| 811 | Multimeter | Fluke | 111 | 78130057 | 12/2/2009 | 12/2/2010 |
| NA | Regulating Transformer | TDGC | 0-250 Vac | NA | NCR | NCR |

Registration of the OATS are on file with the Federal Communications Commission, under Registration Number 90579, the VCCI under registration number R-3027, and are also registered with Industry Canada under Site Numbers 2040B-1 and 2040B-2.

**11696 Sorrento Valley Road, Suite F, San Diego, CA 92121**
**Phone (858) 755-5525 Fax (858) 452-1810**




# Section 4: Observations

## 4.1 Modifications Performed During Assessment

No modifications were performed during assessment.

## 4.2 Record Of Technical Judgements

No technical judgements were made during the assessment.

## 4.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

## 4.4 Tests Deleted

No Tests were deleted from this assessment.

## 4.5 Additional Observations

There were no additional observations made during this assessment.

**11696 Sorrento Valley Road, Suite F, San Diego, CA 92121**
**Phone (858) 755-5525 Fax (858) 452-1810**




# Section 5: Results Summary

This section contains the following:

FCC Part 15 Subpart C: §15.249
IC RSS-210 Issue 7 June 2007 A2.9
IC RSS-Gen Issue 2 June 2007

The column headed “Required” indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

N No: not applicable / not relevant
Y Yes: Mandatory i.e. the apparatus shall conform to these tests.
N/T Not Tested, mandatory but not assessed. (See section 4.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

## 5.1 Results Summary

| FCC | Industry Canada | Test Description | Required | Result |
|---|---|---|---|---|
| 15.107 (a) | RSS-Gen 7.2.2 | Power line Conducted Emissions – Receive or Stand-by Mode | Y | Pass |
| 15.207 (a) | RSS-Gen 7.2.2 | Power line Conducted Emissions -- Transmit Mode | Y | Pass |
| 15.215 (c) | RSS-Gen 4.6.1 | Occupied Bandwidth | Y | Pass |
| | | Duty Cycle Test | Y | Pass |
| 15.249 (a) | RSS-Gen 4.8 & 4.9 & RSS-210 A2.9 | Field Strength of Emissions | Y | Pass |
| 15.249 (d)<br>15.209 (a) | RSS-Gen 4.9 & RSS-210 A2.9 | Spurious Emissions Outside of the band | Y | Pass |
| 15.249 (b) | | Fixed Point-to-Point Operation | N | |
| 15.109 (a) | RSS-Gen 4.10<br>RSS-Gen 7.2.3 | Receiver Spurious Emissions | Y | Pass |

# Appendix A: Test Results

## Power line Conducted Emissions / Receiver or Stand-by Mode

RSS-Gen Table 2 - AC Power Lines Conducted Emission Limits

| Frequency range (MHz) | Conducted limit (dBµV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15 – 0.5 | 66 to 56* | 56 to 46* |
| 0.5 – 5 | 56 | 46 |
| 5 – 30 | 60 | 50 |

## Test Conditions:

| | | | |
|---|---|---|---|
| **Sample Number:** | **HG0129** | **Temperature:** | 22°C |
| **Date:** | 4-6-2010 | **Humidity:** | 44% |
| **Modulation State:** | Modulated | **Tester:** | **Alan Laudani** |
| | | **Laboratory:** | Shielded room 2 |

## Test Parameters:

Peak RBW: 100kHz VBW: 100kHz
Quasi-Peak: RBW 9kHz, VBW 30 kHz
Average: RBW 9kHz, VBW 30 kHz
Quasi-Peak Limit Red Line, Average Limit Purple Line

**Sweep Settings ( 1 Range )**

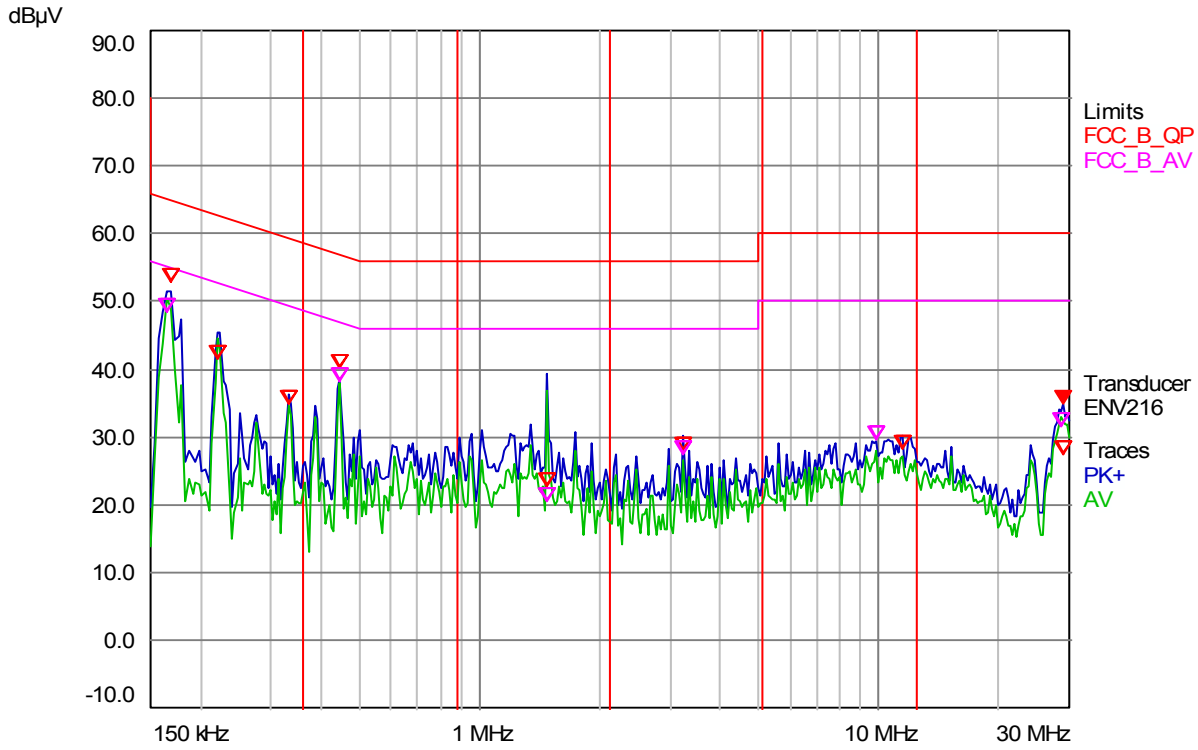
| Frequencies | | | Analyzer Settings | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Start** | **Stop** | **Sweep Points** | **Res BW** | **Sweep Time** | **Atten** | **Preamp** | **Pre-selector** | **Ref Level** |
| 150 kHz | 30 MHz | 8001 | 9 kHz (6dB) | 1 s | Auto | Off | Off | 80 dBµV |

**Final Measurement**

Detectors: QP , AV Meas Time: 1 s

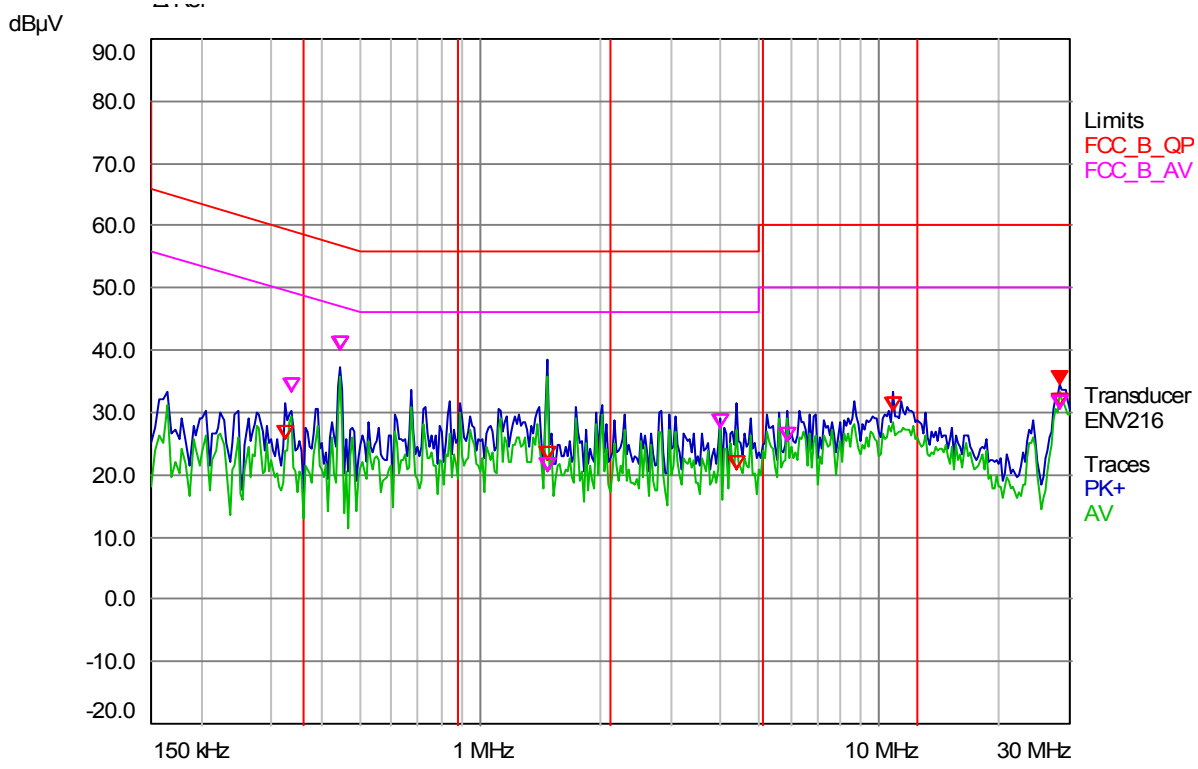
## Test Results: EUT Complies

Mode: Receive, laser system on, rotating operation
Input: Line



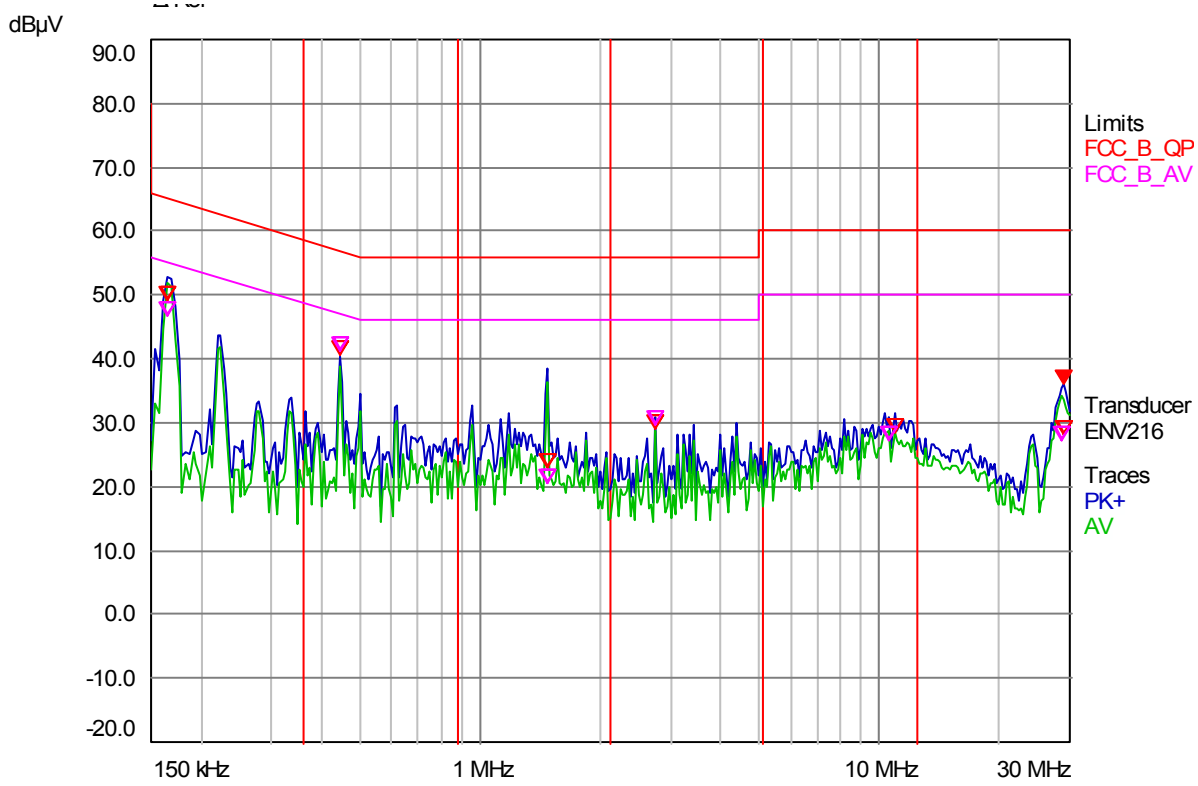

| Trace | Frequency (MHz) | Level ( dBµV) | Limit ( dBµV) | Delta Limit (dB) |
|---|---|---|---|---|
| 1 QP | 0.168656 | 52.81 | 65.03 | -12.22 |
| 2 AV | 0.164925 | 48.52 | 55.21 | -6.69 |
| 1 QP | 0.220894 | 41.52 | 62.79 | -21.27 |
| 1 QP | 0.332831 | 34.80 | 59.38 | -24.58 |
| 1 QP | 0.4485 | 40.08 | 56.90 | -16.82 |
| 2 AV | 0.444769 | 38.24 | 46.97 | -8.73 |
| 1 QP | 1.478325 | 22.67 | 56.00 | -33.33 |
| 2 AV | 1.478325 | 20.50 | 46.00 | -25.50 |
| 1 QP | 3.250669 | 27.83 | 56.00 | -28.17 |
| 2 AV | 3.246938 | 27.51 | 46.00 | -18.49 |
| 1 QP | 11.493 | 28.18 | 60.00 | -31.82 |
| 2 AV | 9.810206 | 29.63 | 50.00 | -20.37 |
| 1 QP | 28.996294 | 27.27 | 60.00 | -32.73 |
| 2 AV | 28.619438 | 31.43 | 50.00 | -18.57 |

Mode: Receive, laser system on, rotating operation
Input: Neutral



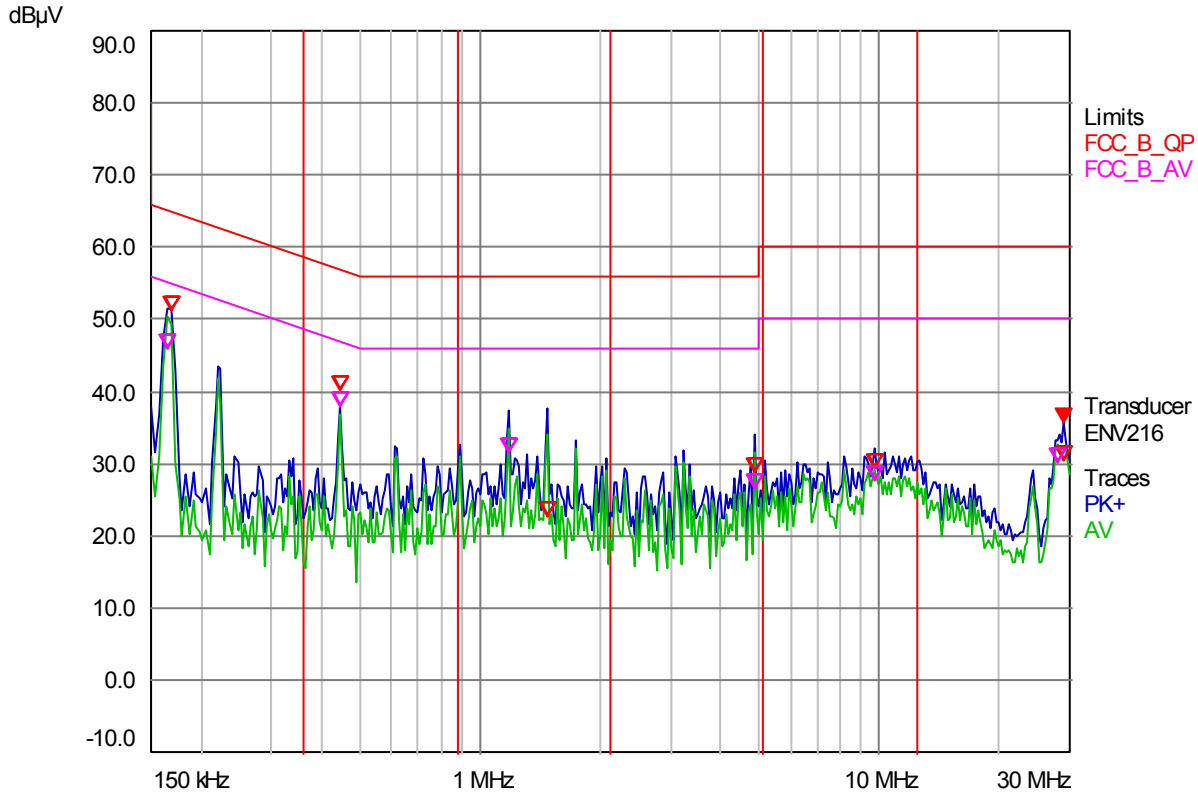

| Trace | Frequency (MHz) | Level ( dBµV) | Limit ( dBµV) | Delta Limit (dB) |
|---|---|---|---|---|
| 1 QP | 0.325369 | 25.74 | 59.57 | -33.83 |
| 2 AV | 0.336563 | 33.32 | 49.29 | -15.97 |
| 1 QP | 0.4485 | 39.92 | 56.90 | -16.98 |
| 2 AV | 0.4485 | 40.08 | 46.90 | -6.82 |
| 1 QP | 1.478325 | 22.44 | 56.00 | -33.56 |
| 2 AV | 1.478325 | 20.45 | 46.00 | -25.55 |
| 1 QP | 4.366313 | 20.80 | 56.00 | -35.20 |
| 2 AV | 3.978263 | 27.42 | 46.00 | -18.58 |
| 2 AV | 5.884931 | 25.31 | 50.00 | -24.69 |
| 1 QP | 10.869881 | 30.23 | 60.00 | -29.77 |
| 1 QP | 28.182881 | 30.80 | 60.00 | -29.20 |
| 2 AV | 28.182881 | 30.71 | 50.00 | -19.29 |

Mode: Transmit, laser system on, rotating operation
Input: Line




| Trace | Frequency (MHz) | Level ( dBµV) | Limit ( dBµV) | Delta Limit (dB) |
|---|---|---|---|---|
| 1 QP | 0.164925 | 49.03 | 65.21 | -16.18 |
| 2 AV | 0.164925 | 46.78 | 55.21 | -8.43 |
| 1 QP | 0.4485 | 40.53 | 56.90 | -16.37 |
| 2 AV | 0.4485 | 41.17 | 46.90 | -5.73 |
| 1 QP | 1.467131 | 22.99 | 56.00 | -33.01 |
| 2 AV | 1.467131 | 20.49 | 46.00 | -25.51 |
| 1 QP | 2.74695 | 29.19 | 56.00 | -26.81 |
| 2 AV | 2.74695 | 29.55 | 46.00 | -16.45 |
| 1 QP | 10.981819 | 28.30 | 60.00 | -31.70 |
| 2 AV | 10.593769 | 27.08 | 50.00 | -22.92 |
| 1 QP | 28.869431 | 28.06 | 60.00 | -31.94 |
| 2 AV | 28.682869 | 27.22 | 50.00 | -22.78 |

Mode: Transmit, laser system on, rotating operation
Input: Neutral




| Trace | Frequency (MHz) | Level ( dBµV) | Limit ( dBµV) | Delta Limit (dB) |
|---|---|---|---|---|
| 2 AV | 0.164925 | 45.85 | 55.21 | -9.36 |
| 1 QP | 0.168656 | 51.14 | 65.03 | -13.89 |
| 2 AV | 0.444769 | 37.89 | 46.97 | -9.08 |
| 1 QP | 0.4485 | 40.13 | 56.90 | -16.77 |
| 2 AV | 1.176094 | 31.64 | 46.00 | -14.36 |
| 1 QP | 1.478325 | 22.59 | 56.00 | -33.41 |
| 1 QP | 4.873763 | 28.82 | 56.00 | -27.18 |
| 2 AV | 4.873763 | 26.65 | 46.00 | -19.35 |
| 1 QP | 9.746775 | 29.22 | 60.00 | -30.78 |
| 2 AV | 9.746775 | 27.78 | 50.00 | -22.22 |
| 2 AV | 27.932888 | 30.11 | 50.00 | -19.89 |
| 1 QP | 28.806 | 30.45 | 60.00 | -29.55 |

## Occupied Bandwidth

4.6.1 Occupied Bandwidth
When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.
The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

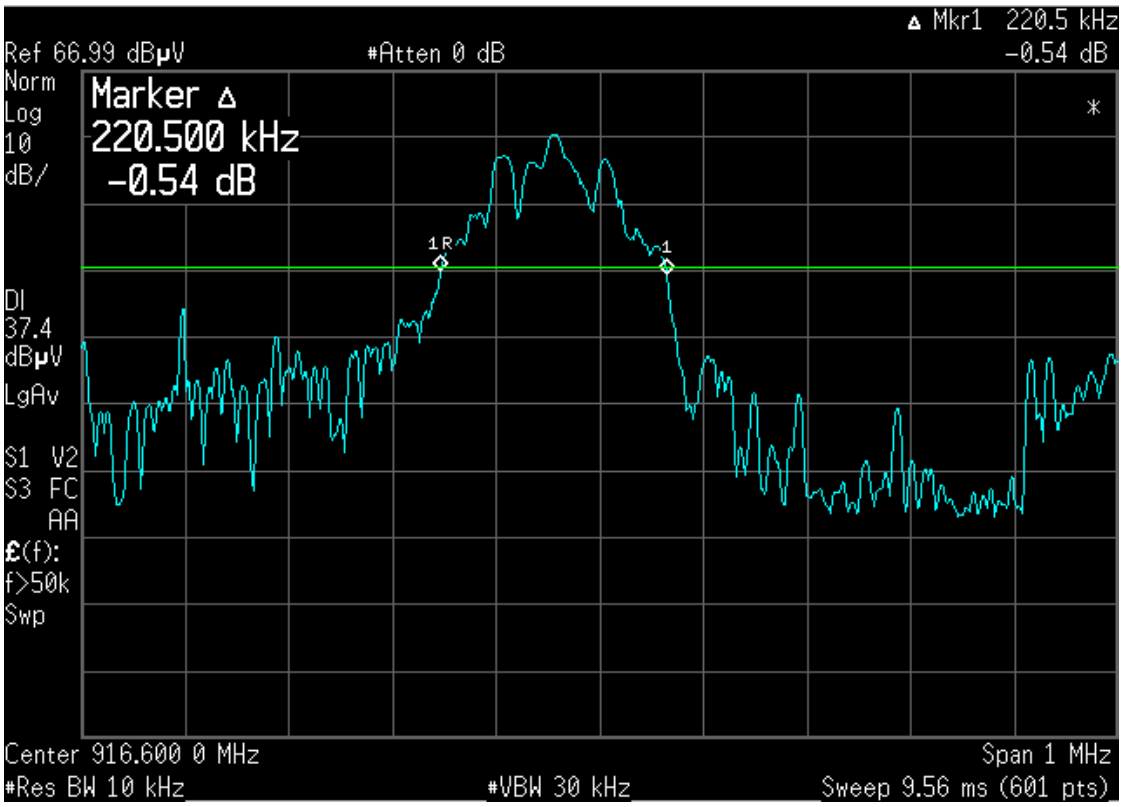
Clause 15.215(c); Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

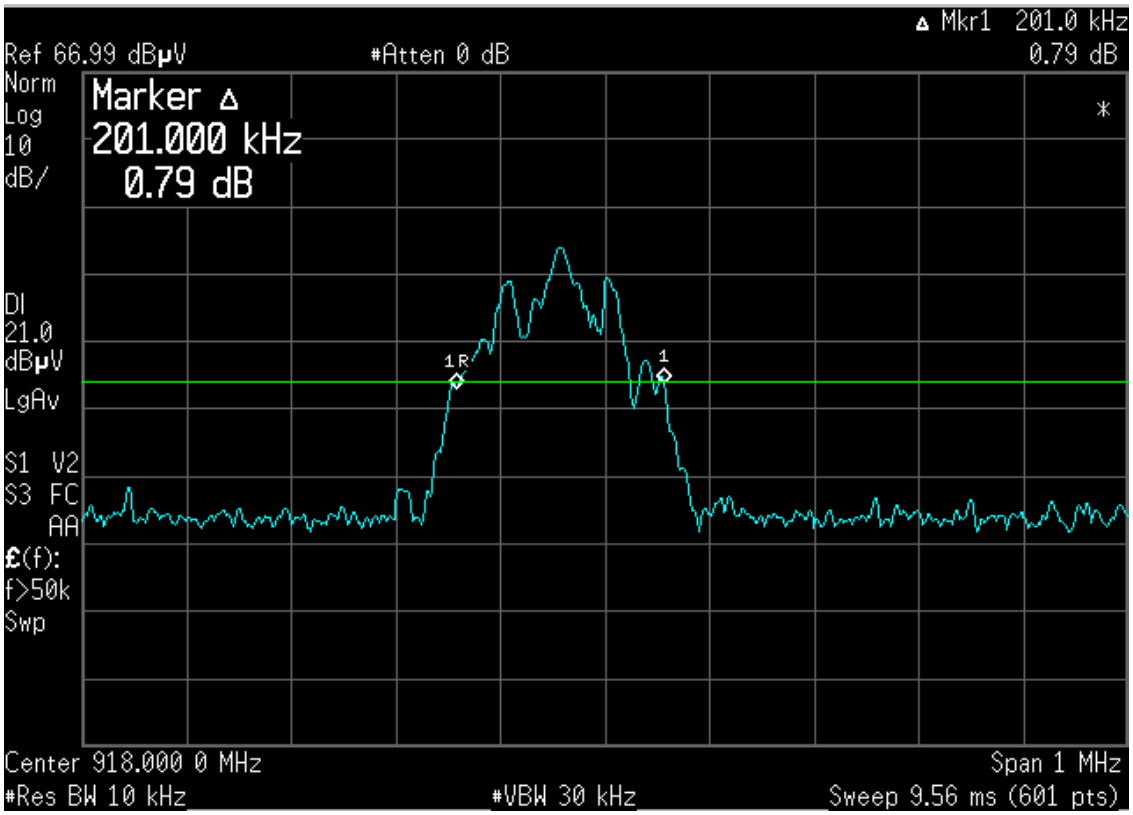
## Test Conditions:

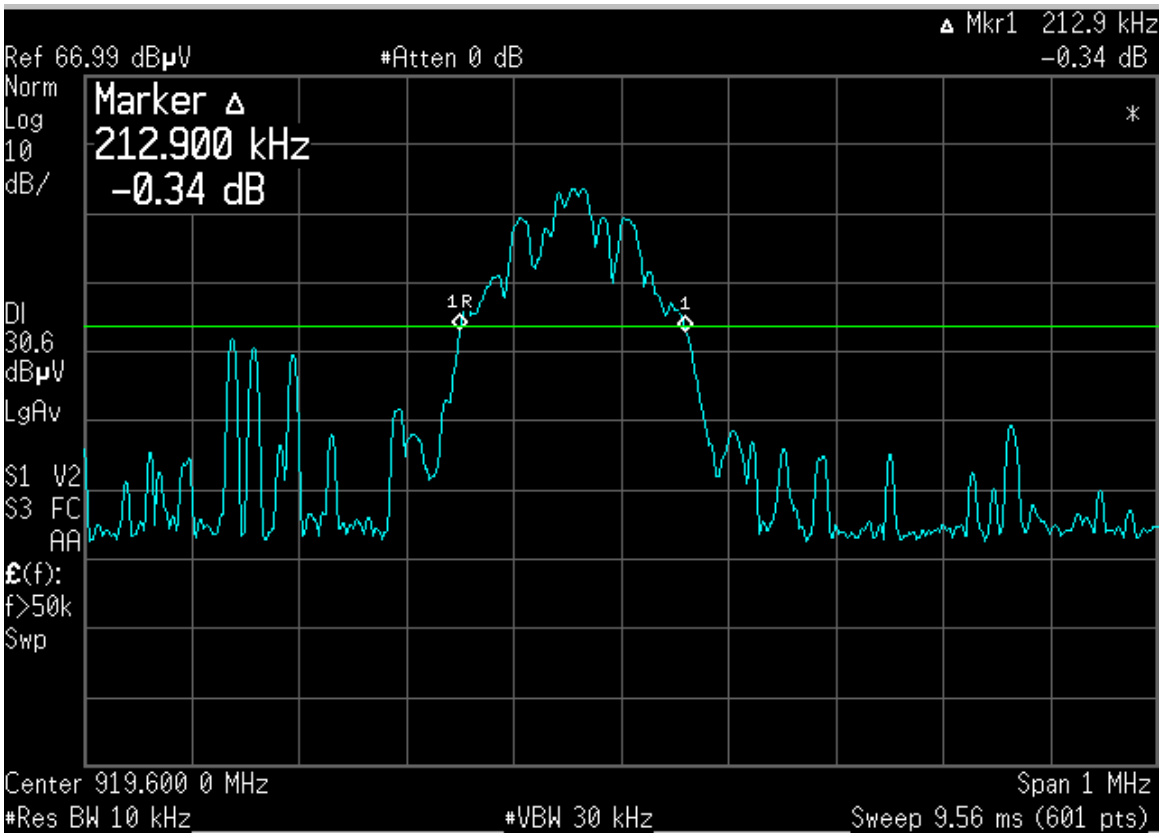
| | | | |
|---|---|---|---|
| **Sample Number:** | **HG0129** | **Temperature:** | 22°C |
| **Date:** | 7-15-2010 | **Humidity:** | 40% |
| **Modulation State:** | Modulated | **Tester:** | Alan Laudani |
| | | **Laboratory:** | SOATS |

## Test Results: 220 kHz

- Span is wide enough to capture the channel transmission
- RBW is 1% of the span
- VBW is 3X RBW
- Sweep is auto
- Detector is Peak
- Trace is Max Hold
- A peak output max hold reading was taken, a display line was drawn 20 dB lower than peak level. The 20 dB bandwidth was determined from where the channel output spectrum intersected the display line.


Ref 66.99 dBµV
#Atten 0 dB
Mkr1 220.5 kHz
-0.54 dB
Norm
Log
10
dB/
Marker Δ
220.500 kHz
-0.54 dB
1R
1
Dl
37.4
dBµV
LgAv
S1 V2
S3 FC
AA
£(f):
f>50k
Swp
Center 916.600 0 MHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 9.56 ms (601 pts)


Ref 66.99 dBµV
#Atten 0 dB
Mkr1 201.0 kHz
0.79 dB
Norm
Log
10
dB/
Marker Δ
201.000 kHz
0.79 dB
1R
1
Dl
21.0
dBµV
LgAv
S1 V2
S3 FC
AA
£(f):
f>50k
Swp
Center 918.000 0 MHz
#Res BW 10 kHz
#VBW 30 kHz
Span 1 MHz
Sweep 9.56 ms (601 pts)


Ref 66.99 dBµV
#Atten 0 dB
Mkr1 212.9 kHz
-0.34 dB
Norm
Log
10
dB/
Marker Δ
212.900 kHz
-0.34 dB
1R
1
Dl
30.6
dBµV
LgAv
S1 V2
S3 FC
AA
£(f):
f>50k
Swp
Center 919.600 0 MHz
Span 1 MHz
#Res BW 10 kHz
#VBW 30 kHz
Sweep 9.56 ms (601 pts)

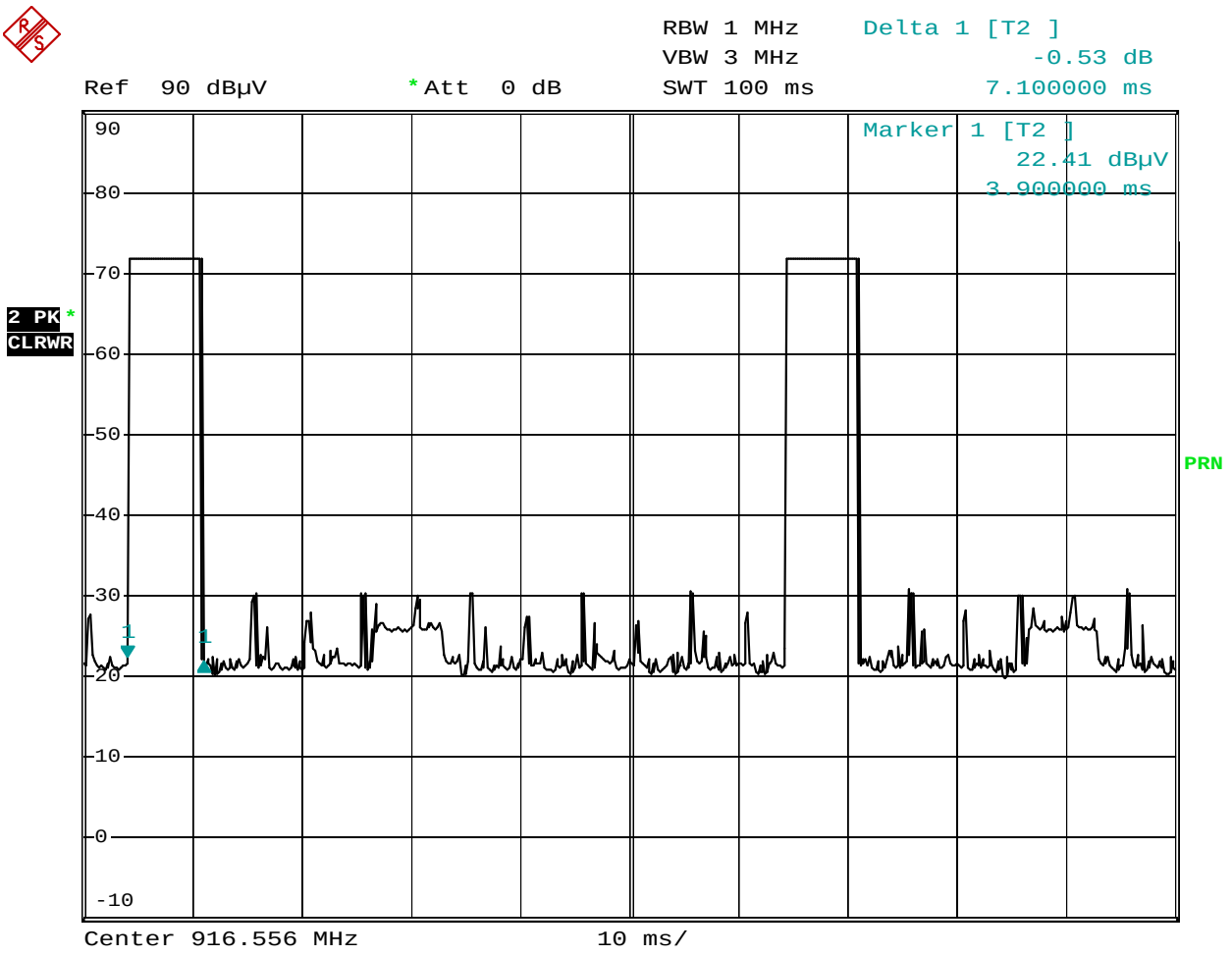
## Duty Cycle Test

### Test Conditions:

| | | | |
|---|---|---|---|
| **Sample Number:** | **HG0129** | **Temperature:** | 17°C |
| **Date:** | 4-6-2010 | **Humidity:** | 70% |
| **Modulation State:** | w/ modulation | **Tester:** | Alan Laudani |
| | | **Laboratory:** | SOATS |

**Test Results:** The modulation is digital.

Duty cycle factor = 20 x log((0.007s+ 0.007s)/100ms) = -17dB




Date: 6.APR.2010 15:21:49

## Field Strength of Emissions

15.249(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency (MHz) | Field strength of fundamental (mV/meter) | Field strength of harmonics (uV/meter) |
|---|---|---|
| 902-928 | 50 | 500 |
| 2400-2483.5 | 50 | 500 |
| 5725-5875 | 50 | 500 |
| 24000-24250 | 250 | 2500 |

## Emissions radiated outside of the band

15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Sec. 15.209, whichever is the lesser attenuation.

## Test Conditions:

| | | | |
|---|---|---|---|
| **Sample Number:** | **HG0129** | **Temperature:** | 19°C |
| **Date:** | 7-15-2010 | **Humidity:** | 43% |
| **Modulation State:** | w/ modulation | **Tester:** | Alan Laudani |
| | | **Laboratory:** | SOATS |

**Test Results:** See Table. EUT complies for fundamental power, band edges and spurious emissions.

## Additional Observations:

- All digital emission measurements below 1 GHz were performed at 3m employing a CISPR quasi-peak detector
- Peak measurements above 1 GHz utilize a RBW of 1 MHz and a VBW of 3 MHz
- Power levels did not change when input power was varied by 15%. An autotransformer and multimeters was used to vary the input 120 Vac to the charger. Non-charger measurements were performed when batteries were fully charged.
- The Spectrum was searched from 30 MHz to the 10$^{th}$ Harmonic (9084 MHz), but no emissions other than reported within 20 dB of the limits were evident.
- All Measurements below 1 GHz were performed at 3m employing a CISPR quasi-peak detector
- Peak measurements above 1 GHz utilize a RBW of 1 MHz and a VBW of 3 MHz
- Peak measurements below 1 GHz utilize a RBW of 100 kHz and a VBW of 300 kHz

Limit = 50 mV/m
Measured Peak reading 61.6 dBuV + antenna factor 23.3 dB/m + Cable loss 5.1 dB = 90.0 dBuV/
$10^{((90.0-120)/20)}$ = 0.032 V/m, or 32 mV/m

For pulse modulated devices with a pulse-repetition frequency of 20 Hz or less and for which CISPR quasi-peak measurements are specified, compliance with the regulations shall be demonstrated using measuring equipment employing a peak detector function, properly adjusted for such factors as pulse desensitization, using the same measurement bandwidths that are indicated for CISPR quasi-peak measurements

## Radiated Emissions Data

Job # : 43561 Date : 7-15-2010 Page 1 of 1
NEX #: 147536 Time : 1510
Staff : AAL

Client Name : AGL Corporation
EUT Name : Laser Levelling System
EUT Model # : GP15
EUT Serial # : HG0129
EUT Config. : TRANSMIT/LASER ON
On battery

EUT Voltage : 12
EUT Frequency : dc
Phase: -
NOATS
SOATS X
Distance < 1000 MHz: 3 m
Distance > 1000 MHz: 3 m

Specification : CFR47 Part 15, Subpart B, Class B
Loop Ant. #: NA
Bicon Ant.#: 114_3M Temp. (°C) : 19
Log Ant.#: 110_3M Humidity (%) : 43
DRG Ant. # 877 Spec Analyzer #: 898 911
Cable LF#: SOATS Analyzer Display #: 898 911
Cable HF#: SOATS Quasi-Peak Detector #: 898
Preamp LF#: NA Preselector #: 899
Preamp HF# 317

| | |
|---|---|
| Quasi-Peak | RBW: 120 kHz |
| | Video Bandwidth 300 kHz |
| Peak < 1000 | RBW: 100 kHz |
| | Video Bandwidth 300 kHz |
| Peal > 1000 MHz | RBW: 1 MHz |
| | Video Bandwidth 10 Hz |
| Average | RBW: 2 MHz |
| | Video Bandwidth 11 Hz |

| Meas. Freq. (MHz) | Meter Reading **Vertical** | Meter Reading **Horizontal** | Det. | EUT Side F/L/R/B | Ant. Height m | Max. Reading (dBµV) | Corrected Reading (dBµV/m) | Spec. limit (dBµV/m) | CR/SL Diff. (dB) | Pass Fail | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.4 | 18.2 | 15.4 | Q | - | 1.0 | 18.2 | 31.1 | 40.0 | -8.9 | Pass | |
| 86.1 | 25.7 | 13.1 | Q | - | 1.0 | 25.7 | 35.0 | 40.0 | -5.0 | Pass | |
| 223.8 | 25.5 | 22.3 | Q | - | 1.0 | 25.5 | 39.3 | 46.0 | -6.7 | Pass | |
| 271.9 | 14.0 | 11.4 | Q | - | 1.0 | 14.0 | 29.9 | 46.0 | -16.1 | Pass | |
| 287.8 | 13.5 | 11.4 | Q | - | 1.0 | 13.5 | 29.9 | 46.0 | -16.1 | Pass | |
| 399.9 | 13.7 | 11.3 | Q | - | 1.0 | 13.7 | 32.9 | 46.0 | -13.1 | Pass | |
| 431.9 | 7.9 | 8.3 | Q | - | 1.0 | 8.3 | 28.2 | 46.0 | -17.8 | Pass | |

## Radiated Emissions Data

Job # : 43561 Date : 7-15-2010 Page 1 of 1
NEX #: 147536 Time : 1120
Staff : AAL

Client Name : AGL Corporation
EUT Name : Laser Levelling System
EUT Model # : GP15
EUT Serial # : HG0129
EUT Config. : TRANSMIT/LASER ON
CHARGING

EUT Voltage : 120
EUT Frequency : 60
Phase: 1
NOATS
SOATS X
Distance < 1000 MHz: 3 m
Distance > 1000 MHz: 3 m

Specification : CFR47 Part 15, Subpart B, Class B
Loop Ant. #: NA
Bicon Ant.#: 114_3M Temp. (°C) : 19
Log Ant.#: 110_3M Humidity (%) : 43
DRG Ant. # 877 Spec Analyzer #: 898 911
Cable LF#: SOATS Analyzer Display #: 898 911
Cable HF#: SOATS Quasi-Peak Detector #: 898
Preamp LF#: NA Preselector #: 899
Preamp HF# 317

| | |
|---|---|
| Quasi-Peak | RBW: 120 kHz |
| | Video Bandwidth 300 kHz |
| Peak < 1000 | RBW: 100 kHz |
| | Video Bandwidth 300 kHz |
| Peal > 1000 MHz | RBW: 1 MHz |
| | Video Bandwidth 10 Hz |
| Average | RBW: 2 MHz |
| | Video Bandwidth 11 Hz |

| Meas. Freq. (MHz) | Meter Reading **Vertical** | Meter Reading **Horizontal** | Det. | EUT Side F/L/R/B | Ant. Height m | Max. Reading (dBµV) | Corrected Reading (dBµV/m) | Spec. limit (dBµV/m) | CR/SL Diff. (dB) | Pass Fail | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46.0 | 13.5 | 6.6 | Q | - | 1.0 | 13.5 | 26.2 | 40.0 | -13.8 | Pass | |
| 52.4 | 18.2 | 15.4 | Q | - | 1.0 | 18.2 | 31.1 | 40.0 | -8.9 | Pass | |
| 86.1 | 25.7 | 13.1 | Q | - | 1.0 | 25.7 | 35.0 | 40.0 | -5.0 | Pass | |
| 112.0 | 20.5 | 13.1 | Q | - | 1.0 | 20.5 | 36.0 | 43.5 | -7.5 | Pass | |
| 128.0 | 18.5 | 19.7 | Q | - | 1.0 | 19.7 | 33.0 | 43.5 | -10.5 | Pass | |
| 176.0 | 18.8 | 17.4 | Q | - | 1.0 | 18.8 | 37.0 | 43.5 | -6.5 | Pass | |
| 223.8 | 25.5 | 22.3 | Q | - | 1.0 | 25.5 | 39.3 | 46.0 | -6.7 | Pass | |
| 271.9 | 14.0 | 11.4 | Q | - | 1.0 | 14.0 | 29.9 | 46.0 | -16.1 | Pass | |
| 287.8 | 13.5 | 11.4 | Q | - | 1.0 | 13.5 | 29.9 | 46.0 | -16.1 | Pass | |
| 399.9 | 13.7 | 11.3 | Q | - | 1.0 | 13.7 | 32.9 | 46.0 | -13.1 | Pass | |
| 431.9 | 7.9 | 8.3 | Q | - | 1.0 | 8.3 | 28.2 | 46.0 | -17.8 | Pass | |

## Radiated Emissions Data

Job # : 43561 Date : 9-2-2010 Page 1 of 1
NEX #: 147536 Time : 0930
Staff : AAL

Client Name : AGL Corporation
EUT Name : System
EUT Model # : GP15
EUT Serial # : HG0129
EUT Config. : transmit
test mode

EUT Voltage : 12
EUT Frequency : dc
Phase: batt
NOATS X
SOATS
Distance < 1000 MHz: 3 m
Distance > 1000 MHz: 3 m

Specification : CFR47 Part 15, Subpart B, Class B
Loop Ant. #: NA
Bicon Ant.#: 128_3m Temp. (°C) : 28
Log Ant.#: 110_3m Humidity (%) : 78
DRG Ant. # 752 Spec Analyzer #: 898 835
Cable LF#: SOATS Analyzer Display #: 898 835
Cable HF#: SOATS Quasi-Peak Detector #: 898
Preamp LF#: na Preselector #: NA
Preamp HF# 317

| | | |
|---|---|---|
| Quasi-Peak | RBW: | 120 kHz |
| | Video Bandwidth | 300 kHz |
| Peak | RBW: | 1 MHz |
| | Video Bandwidth | 3 MHz |
| Average | RBW: | 1 MHz |
| | Video Bandwidth | 10 Hz |

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.
Measurements above 1 GHz are Average values, unless otherwise stated.

| Meas. Freq. (MHz) | Meter Reading **Vertical** | Meter Reading **Horizontal** | Det. | EUT Side F/L/R/B | Ant. Height m | Max. Reading (dBµV) | Corrected Reading (dBµV/m) | Spec. limit (dBµV/m) | CR/SL Diff. (dB) | Pass Fail | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 902.0 | -3.4 | -3.5 | Q | - | 1.0 | -3.4 | 25.1 | 46.0 | -20.9 | Pass | |
| 928.0 | -3.6 | -3.6 | Q | - | 1.0 | -3.6 | 24.8 | 46.0 | -21.2 | Pass | |
| 916.6 | 61.6 | 57.8 | P | - | 1.0 | 61.6 | 90.0 | 94.0 | -4.0 | Pass | |
| 1833.1 | 46.2 | 46.1 | P | - | 1.0 | 46.2 | 47.6 | 74.0 | -26.4 | Pass | |
| 1833.1 | 29.2 | 29.1 | A | - | 1.0 | 29.2 | 30.6 | 54.0 | -23.4 | Pass | |
| 2749.7 | 49.2 | 48.7 | P | - | 1.0 | 49.2 | 54.3 | 74.0 | -19.7 | Pass | |
| 2749.7 | 32.2 | 31.7 | A | - | 1.0 | 32.2 | 37.3 | 54.0 | -16.7 | Pass | |
| 919.6 | 60.6 | 57.6 | P | - | 1.0 | 60.6 | 89.0 | 94.0 | -5.0 | Pass | |
| 1839.2 | 46.1 | 45.9 | P | - | 1.0 | 46.1 | 47.5 | 74.0 | -26.5 | Pass | |
| 1839.2 | 29.1 | 28.9 | A | - | 1.0 | 29.1 | 30.5 | 54.0 | -23.5 | Pass | |
| 2758.8 | 49.0 | 48.8 | P | - | 1.0 | 49.0 | 54.1 | 74.0 | -19.9 | Pass | |
| 2758.8 | 32.0 | 31.8 | A | - | 1.0 | 32.0 | 37.1 | 54.0 | -16.9 | Pass | |

## Radiated Emissions Data

Job # : 43561 Date : 9-2-2010 Page 1 of 1
NEX #: 147536 Time : 0810
Staff : AAL

Client Name : AGL Corporation
EUT Name : System
EUT Model # : GP15
EUT Serial # : HG0129
EUT Config. : transmit
test mode

EUT Voltage : 120
EUT Frequency : ac
Phase: 1
NOATS X
SOATS
Distance < 1000 MHz: 3 m
Distance > 1000 MHz: 3 m

Specification : CFR47 Part 15, Subpart B, Class B
Loop Ant. #: NA
Bicon Ant.#: 128_3m Temp. (°C) : 28
Log Ant.#: 110_3m Humidity (%) : 78
DRG Ant. # 752 Spec Analyzer #: 898 835
Cable LF#: SOATS Analyzer Display #: 898 835
Cable HF#: SOATS Quasi-Peak Detector #: 898
Preamp LF#: na Preselector #: NA
Preamp HF# 317

| | | |
|---|---|---|
| Quasi-Peak | RBW: | 120 kHz |
| | Video Bandwidth | 300 kHz |
| Peak | RBW: | 1 MHz |
| | Video Bandwidth | 3 MHz |
| Average | RBW: | 1 MHz |
| | Video Bandwidth | 10 Hz |

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.
Measurements above 1 GHz are Average values, unless otherwise stated.

| Meas. Freq. (MHz) | Meter Reading **Vertical** | Meter Reading **Horizontal** | Det. | EUT Side F/L/R/B | Ant. Height m | Max. Reading (dBµV) | Corrected Reading (dBµV/m) | Spec. limit (dBµV/m) | CR/SL Diff. (dB) | Pass Fail | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 902.0 | -3.4 | -3.5 | Q | - | 1.0 | -3.4 | 25.1 | 46.0 | -20.9 | Pass | |
| 928.0 | -3.6 | -3.6 | Q | - | 1.0 | -3.6 | 24.8 | 46.0 | -21.2 | Pass | |
| 916.6 | 61.6 | 57.8 | P | - | 1.0 | 61.6 | 90.0 | 94.0 | -4.0 | Pass | |
| 1833.1 | 46.2 | 46.1 | P | - | 1.0 | 46.2 | 47.6 | 74.0 | -26.4 | Pass | |
| 1833.1 | 29.2 | 29.1 | A | - | 1.0 | 29.2 | 30.6 | 54.0 | -23.4 | Pass | |
| 2749.7 | 49.2 | 48.7 | P | - | 1.0 | 49.2 | 54.3 | 74.0 | -19.7 | Pass | |
| 2749.7 | 32.2 | 31.7 | A | - | 1.0 | 32.2 | 37.3 | 54.0 | -16.7 | Pass | |
| 919.6 | 60.6 | 57.6 | P | - | 1.0 | 60.6 | 89.0 | 94.0 | -5.0 | Pass | |
| 1839.2 | 46.1 | 45.9 | P | - | 1.0 | 46.1 | 47.5 | 74.0 | -26.5 | Pass | |
| 1839.2 | 29.1 | 28.9 | A | - | 1.0 | 29.1 | 30.5 | 54.0 | -23.5 | Pass | |
| 2758.8 | 49.0 | 48.8 | P | - | 1.0 | 49.0 | 54.1 | 74.0 | -19.9 | Pass | |
| 2758.8 | 32.0 | 31.8 | A | - | 1.0 | 32.0 | 37.1 | 54.0 | -16.9 | Pass | |

## Fixed Point-to-Point Operation

15.249 (b) Fixed, point-to-point operation as referred to in this paragraph shall be limited to systems employing a fixed transmitter transmitting to a fixed remote location. Point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information are not allowed. Fixed, point-to-point operation is permitted in the 24.05–24.25 GHz band subject to the following conditions:
(1) The field strength of emissions in this band shall not exceed 2500 millivolts/meter.
(2) The frequency tolerance of the carrier signal shall be maintained within ±0.001% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.
(3) Antenna gain must be at least 33 dBi. Alternatively, the main lobe beamwidth must not exceed 3.5 degrees. The beamwidth limit shall apply to both the azimuth and elevation planes. At antenna gains over 33 dBi or beamwidths narrower than 3.5 degrees, power must be reduced to ensure that the field strength does not exceed 2500 millivolts/meter.

## Test Conditions:

| Sample Number: | HG0129 | Temperature: | |
|---|---|---|---|
| Date: | | Humidity: | |
| Modification State: | | Tester: | Alan Laudani |
| | | Laboratory: | Nemko |

**Test Results:** Not Applicable, EUT is not Point-to-Point.

## Receiver Spurious Emissions

The following receiver spurious emission limits shall be complied with: If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 1.

**Table 1 - Spurious Emission Limits for Receivers**

| Spurious Frequency (MHz) | Field Strength (microvolt/m at 3 metres) |
|---|---|
| 30-88 | 100 |
| 88-216 | 150 |
| 216-960 | 200 |
| Above 960 | 500 |

## Test Conditions:

| | | | |
|---|---|---|---|
| **Sample Number:** | HG0129 | **Temperature:** | 19°C |
| **Date:** | 7-15-2010 | **Humidity:** | 43% |
| **Modulation State:** | Standby / receive | **Tester:** | Alan Laudani |
| | | **Laboratory:** | SOATS |

## Test Results:

See Table. EUT complies for stand by spurious emissions. It receives and transmits simultaneously—there is no separate receive mode.

## Additional Observations:

- The Spectrum was searched from 30 MHz to the 5$^{th}$ Harmonic (4542 MHz), but no emissions within 20 dB of the limits except in the table below were evident.

## Radiated Emissions Data

Job # : 43561 Date : 7-15-2010 Page 1 of 1
NEX #: 147536 Time : 1030
Staff : AAL

Client Name : AGL Corporation
EUT Name : Laser Levelling System
EUT Model # : GP15
EUT Serial # : HG0129
EUT Config. : STANDBY/LASER ON
CHARGING

EUT Voltage : 120
EUT Frequency : 60
Phase: 1
NOATS
SOATS X
Distance < 1000 MHz: 3 m
Distance > 1000 MHz: 3 m

Specification : CFR47 Part 15, Subpart B, Class B
Loop Ant. #: NA
Bicon Ant.#: 114_3M Temp. (°C) : 19
Log Ant.#: 110_3M Humidity (%) : 43
DRG Ant. # 877 Spec Analyzer #: 898 911
Cable LF#: SOATS Analyzer Display #: 898 911
Cable HF#: SOATS Quasi-Peak Detector #: 898
Preamp LF#: NA Preselector #: 899
Preamp HF# 317

| | | |
|---|---|---|
| Quasi-Peak | RBW: | 120 kHz |
| | Video Bandwidth | 300 kHz |
| Peak | RBW: | 1 MHz |
| | Video Bandwidth | 3 MHz |
| Average | RBW: | 1 MHz |
| | Video Bandwidth | 10 Hz |

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.
Measurements above 1 GHz are Average values, unless otherwise stated.

| Meas. Freq. (MHz) | Meter Reading **Vertical** | Meter Reading **Horizontal** | Det. | EUT Side F/L/R/B | Ant. Height m | Max. Reading (dBµV) | Corrected Reading (dBµV/m) | Spec. limit (dBµV/m) | CR/SL Diff. (dB) | Pass Fail | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46.0 | 13.5 | 6.6 | Q | - | 1.0 | 13.5 | 26.2 | 40.0 | -13.8 | Pass | PS |
| 52.4 | 18.2 | 15.4 | Q | - | 1.0 | 18.2 | 31.1 | 40.0 | -8.9 | Pass | |
| 86.1 | 25.7 | 13.1 | Q | - | 1.0 | 25.7 | 35.0 | 40.0 | -5.0 | Pass | |
| 112.0 | 20.5 | 13.1 | Q | - | 1.0 | 20.5 | 36.0 | 43.5 | -7.5 | Pass | PS |
| 128.0 | 18.5 | 19.7 | Q | - | 1.0 | 19.7 | 33.0 | 43.5 | -10.5 | Pass | PS |
| 176.0 | 18.8 | 17.4 | Q | - | 1.0 | 18.8 | 37.0 | 43.5 | -6.5 | Pass | PS |
| 223.8 | 25.5 | 22.3 | Q | - | 1.0 | 25.5 | 39.3 | 46.0 | -6.7 | Pass | |
| 271.9 | 14.0 | 11.4 | Q | - | 1.0 | 14.0 | 29.9 | 46.0 | -16.1 | Pass | |
| 287.8 | 13.5 | 11.4 | Q | - | 1.0 | 13.5 | 29.9 | 46.0 | -16.1 | Pass | |
| 399.9 | 13.7 | 11.3 | Q | - | 1.0 | 13.7 | 32.9 | 46.0 | -13.1 | Pass | |
| 431.9 | 7.9 | 8.3 | Q | - | 1.0 | 8.3 | 28.2 | 46.0 | -17.8 | Pass | |

# APPENDIX B

## B. Radiated Emissions Measurement Uncertainties

### 1. Introduction

ISO/IEC 17025:2005 and ANSI/NCSL Z540.3: 2006 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**

| Radiated Emissions Measurement Detection Systems | Applicable Frequency Range | "U” for a k=2 Coverage Factor |
|---|---|---|
| Spectrum Analyzer with QPA & Preamplifier | 30 MHz - 200 MHz | +3.9 dB, -4.0 dB |
| Spectrum Analyzer with QPA & Preamplifier | 200 MHz-1000 MHz | +/- 3.5 dB |
| Spectrum Analyzer with Preamplifier | 1 GHz - 18 GHz | +2.5 dB, -2.6 dB |
| Spectrum Analyzer with 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 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:

- *ANSI Z540.2 (2002) Guide to the Expression of Uncertainty in Measurement*
- 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.

# APPENDIX C

## C. Nemko USA, Inc. 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 Z540.3: 2006, ISO 10012:2003, ISO/IEC 17025:2005, and ISO-9000: 2000. Nemko USA, Inc.'s calibrations program therefore meets or exceeds the US national commercial and military requirements [N.B. ANSI/NCSL Z540.1-1994 replaced 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 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(2003) or ANSI C63.5-2004, 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 Sub clause 16.6 and Annex G.2 of CISPR 16-1 (2003), and, ANSI C63.4-2003 when performing the normalized site attenuation measurements.

# APPENDIX D
## D. NVLAP Accreditation

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

## Certificate of Accreditation to ISO/IEC 17025:2005

**NVLAP LAB CODE: 200116-0**

**Nemko USA, Inc. - San Diego EMC Division**
San Diego, CA

*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 18 June 2005).*

2009-01-01 through 2009-12-31
*Effective dates*

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

Sally S. Bruce
*For the National Institute of Standards and Technology*

NVLAP-01C (REV. 2006-09-13)