MET Laboratories, Inc. ***Safety Certification - EMI - Telecom Environmental Simulation***
914 WEST PATAPSCO AVE • BALTIMORE, MD 21230 • **PHONE (410) 354-3300** • **FAX (410) 354-3313**

December 24, 2008

NEC America
2816 Tower View Road
Herndon, VA 20171

Dear Mark Cowles,

Enclosed is the EMC Wireless test report for compliance testing of the NEC America, NLite L as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), Part 15, Subpart B, ICES-003, Issue 4 February 2004 for a Class A Digital Device and FCC Part 15 Subpart C.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Jennifer Warnell
Documentation Department

Reference: (\NEC America\EMC24765A-FCC247 Rev. 1)

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Electromagnetic Compatibility Criteria
Test Report

for the

NEC America
NLite L

Tested under
the FCC Certification Rules
contained in
Title 47 of the CFR, Parts 15 Subpart B
for Class A Digital Devices
&
15.247 Subpart C

MET Report: EMC24765A-FCC247 Rev. 1

December 24, 2008

Prepared For:

NEC America
2816 Tower View Road
Herndon, VA 20171

Prepared By:
MET Laboratories, Inc.
914 W. Patapsco Ave.
Baltimore, MD 21230

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15.247 Subpart C

Len Knight
Project Engineer, Electromagnetic Compatibility Lab

Jennifer Warnell
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules Parts 15B, 15.247 under normal use and maintenance.

Shawn McMillen
Wireless EMC Manager, Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	October 14, 2008	Initial Issue.
1	December 24, 2008	Corrections per engineer.

Table of Contents

List of Tables

List of Photographs

List of Terms and Abbreviations

AC	**A**lternating **C**urrent
ACF	**A**ntenna **C**orrection **F**actor
Cal	**Cal**ibration
d	**M**easurement **D**istance
dB	**D**eci**b**els
dBµA	**D**eci**b**els above one **micro**amp
dBµV	**D**eci**b**els above one **micro**volt
dBµA/m	**D**eci**b**els above one **micro**amp **per m**eter
dBµV/m	**D**eci**b**els above one **micro**volt **per m**eter
DC	**D**irect **C**urrent
E	**E**lectric Field
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
GRP	**G**round **R**eference **P**lane
H	Magnetic Field
HCP	**H**orizontal **C**oupling **P**lane
Hz	**H**ert**z**
IEC	**I**nternational **E**lectrotechnical **C**ommission
kHz	**k**ilo**h**ert**z**
kPa	**k**ilo**pa**scal
kV	**k**ilovolt
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
MHz	**M**ega**h**ertz
µH	**micro**henry
µ	**micro**farad
µs	**micro**seconds
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
TWT	**T**raveling **W**ave **T**ube
V/m	**V**olts **per m**eter
VCP	**V**ertical **C**oupling **P**lane

I. Executive Summary

A. Purpose of Test

An EMC evaluation was performed to determine compliance of the NEC America, NLite L, with the requirements of Part 15, §15.247. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the NLite L. NEC America should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the NLite L, has been **permanently** discontinued

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, §15.247, in accordance with NEC America, purchase order number R507454. All tests were conducted using measurement procedure ANSI C63.4-2003.

FCC Reference	IC Reference	Description	Compliance
Title 47 of the CFR, Part 15 §15.203	N/A	Antenna Requirement	Compliant
Title 47 of the CFR, Part 15 §15.205	RSS-210(A8.5)	Emissions at Restricted Band	Compliant
Title 47 of the CFR, Part 15 §15.207(a)	RSS-210(7.2.2)	Conducted Emission Voltage	Not Applicable
Title 47 of the CFR, Part 15 §15.247(a)(1)	RSS-210(A8.1)	Occupied Bandwidth	Compliant
Title 47 of the CFR, Part 15 §15.247(b)	RSS-210(A8.4)	RF Output Power	Compliant
Title 47 of the CFR, Part 15 §15.209, §15.247(d)	RSS-210(A8.5)	Radiated and Conducted Spurious Emissions	Compliant
Title 47 of the CFR, Part 15; §15.247(e)	RSS-210(A8.3)	Power Spectral Density	Compliant
Title 47 of the CFR, Part 15 §15.247(i)	RSS-Gen(5.5)	Maximum Permissible Exposure	Compliant
N/A	RSS-Gen(4.8)	Receiver Spurious Emissions	Compliant

Table 1. Executive Summary of EMC Part 15.247 ComplianceTesting

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by NEC America to perform testing on the NLite L, under NEC America's purchase order number R507454.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the NEC America, NLite L.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	NLite L	
Model(s) Covered:	NLite L	
EUT Specifications:	Primary Power: -48VDC	
	FCC ID: VQL5828	
	Type of Modulations:	64 QAM
	Highest Clock/Oscillator:	Signal Processing 44.736 MHz
	Equipment Code:	DTS
	Peak RF Output Power:	30.0 dBm
	EUT Frequency Ranges:	5730 – 5845 MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35° C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Evaluated by:	Len Knight	
Date(s):	December 24, 2008	

Table 2. EUT Summary Table

B. References

CFR 47, Part 15, Subpart C	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 15: General Rules and Regulations, Allocation, Assignment, and Use of Radio Frequencies
RSS-210, Issue 7, June 2007	Low-power Licence-exempt Radiocommunications Devices (All Frequency Bands): Category I Equipment
CFR 47, Part 15, Subpart B	Electromagnetic Compatibility: Criteria for Radio Frequency Devices
ICES-003, Issue 4 February 2004	Electromagnetic Compatibility: Criteria for Radio Frequency Devices
ANSI C63.4:2003	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI/NCSL Z540-1-1994	Calibration Laboratories and Measuring and Test Equipment - General Requirements
ANSI/ISO/IEC 17025:2000	General Requirements for the Competence of Testing and Calibration Laboratories

Table 3. References

C. Test Site

All testing was performed at MET Laboratories, Inc., 914 W. Patapsco Ave., Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 3 meter semi-anechoic chamber . In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

D. Description of Test Sample

The NLite L Equipment Under Test (EUT), is as follows:

The 5.8 GHz ODU (Outdoor Unit) is the RF portion of the NLite L radio, it interfaces back to the IDU (Indoor Unit) over an IF cable using 10 MHz, 140 MHz & 340 MHz.

E. Equipment Configuration

The EUT was set up as outlined in Figure 2, Block Diagram of Test Setup.

Ref. ID	Name / Description	Model Number	Manufacturer	Serial Number
1	MDP50MB6T1C/2D IDU	N/A	NEC	1002
2	TRP-6G-6AA ODU	HO2600 SUB BAND A LOW	NEC	1063
3	TRP-6G-6AA ODU	HO2600 SUB BAND A LOW	NEC	N/A
2	TRP-6G-6AA ODU	HO2600 SUB BAND B HIGH	NEC	1060
3	TRP-6G-6AA ODU	HO2600 SUB BAND B HIGH	NEC	N/A
2	TRP-6G-6AA ODU	HO2600 SUB BAND C HIGH	NEC	1062
3	TRP-6G-6AA ODU	HO2600 SUB BAND C HIGH	NEC	N/A
4	3 DB POWER SPLITTER	11667A	HP	N/A
5	ANTENNA, 5.8 GHZ	P2F-52-N7A	ANDREW	07DESA0267504

Table 4. Equipment Configuration

F. Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

Ref. ID	Name / Description	Manufacturer	Model Number
1	TTC MODEL 310 TEST SET	TTC	MODEL 310
2	LAPTOP PC	DELL	1501

Table 5. Support Equipment

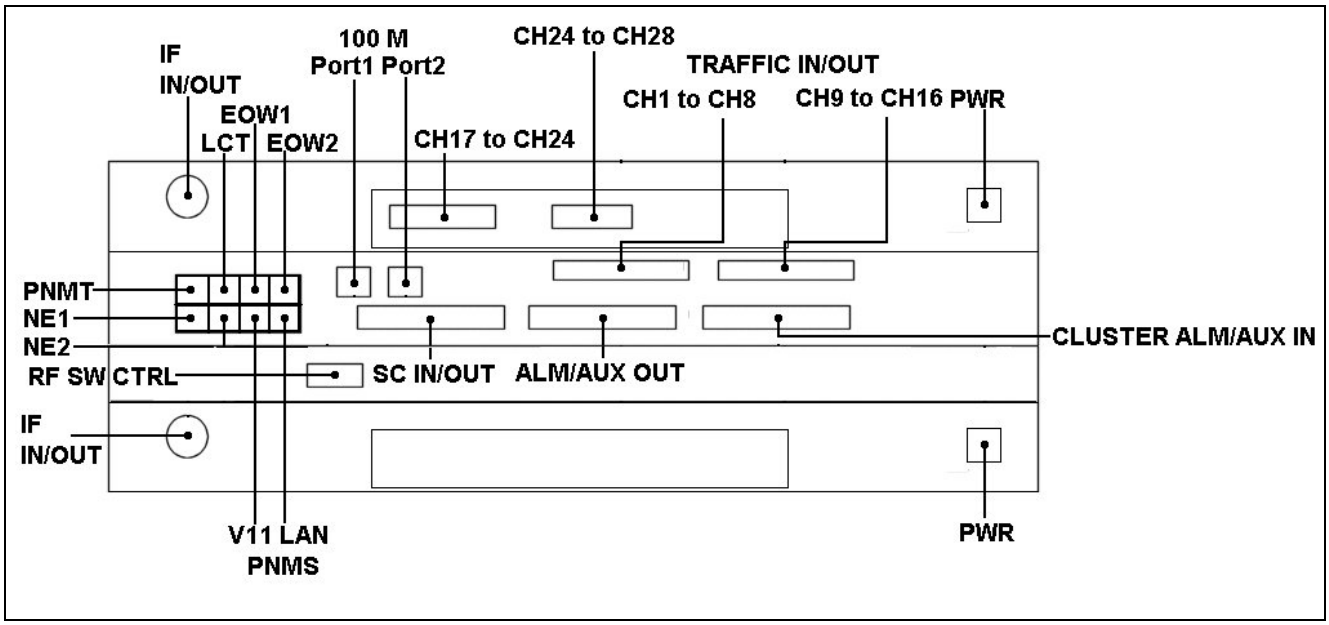


Figure 1. Port Identification for NLite L

G. Ports and Cabling Information

Port name on EUT	Cable Description or reason for no cable	Qty.	Length (m)	Shielded? (Y/N)	Termination Box ID & Port ID
NE-1 NE-2	NETWORKING PORTS	2 EA.	3.7	N	NE-1 NE-2
EOW-1 & EOW-2	ORDERWIRE PORTS	2 EA.	3.7	N	EOW-1 & EOW-2
SC LAN	LAN PORT	1 EA.	3.7	N	SC LAN
PNMS/V.11 LAN	NETWORK MGR PORT	1 EA.	3.7	N	PNMS/V.11 LAN
PNMT	CRAFT PORT	1 EA.	3.7	N	PNMT
LCT	CRAFT PORT	1 EA.	3.7	N	LCT
ALARM	ALARMS	1 EA.	3.7	Y	ALARM
AUX	DI AND DO	1 EA.	3.7	Y	AUX
CLUSTER ALARM	ALARMS	1 EA.	3.7	Y	CLUSTER ALARM
DS1	TRAFFIC	4 EA.	9.1	Y	DS1
RF SW CTRL	UNTERMINATED – PORT NOT USED	N/A	N/A	N/A	N/A
100 M PORT 1	CAT 5	1 EA.	3.7	Y	TERMINAL BLOCK
100 M PORT 2	CAT 5	1 EA.	3.7	Y	TERMINAL BLOCK

Table 6. Ports and Cabling Information

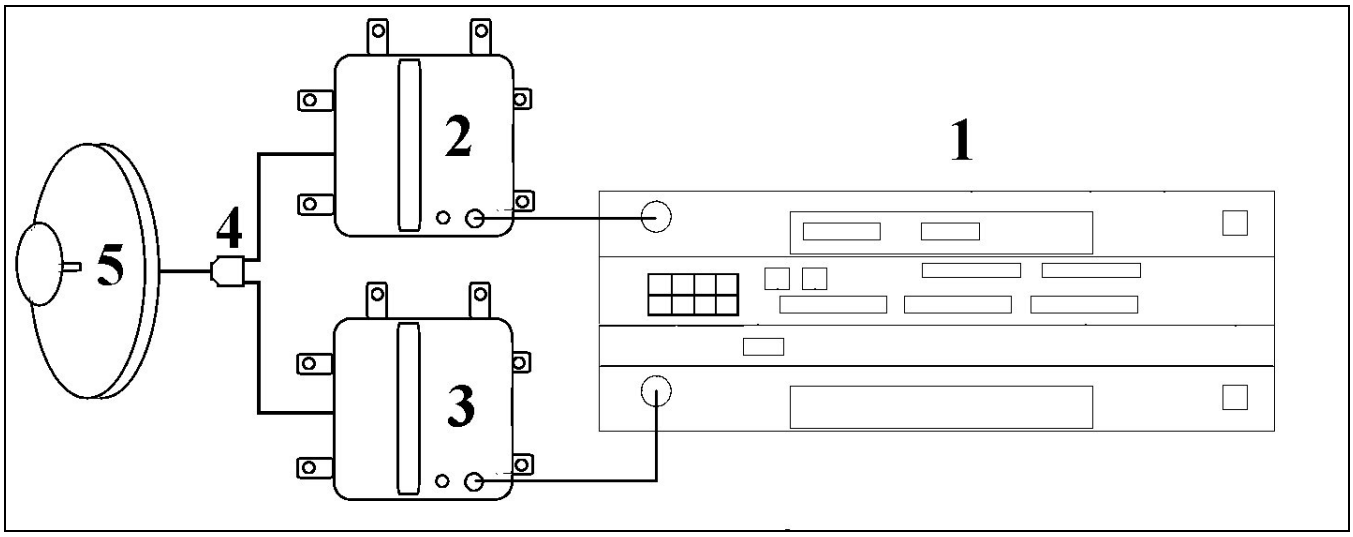


Figure 2. Block Diagram of Test Configuration

H. Mode of Operation

The EUT was configured as one end of a normal radio hop. Cables were provided to approximate all customer connections. A BER test set provided simulated customer traffic to all channels.

I. Method of Monitoring EUT Operation

28 X DS1:

Using the LCT craft interface, the test engineer could verify that the radio was generating the proper RF output level. The TTC-310 test set provided an indication that all channels were being presented with simulated customer data.

J. Modifications

a) Modifications to EUT

The following is a modification for compliance to 15.109:

A clamp on ferrite, Fair-Rite M/N: 0444177081, was added to the following cables:

In/Out 1-8,

In/Out 9-16,

In/Out 17-24

In/Out 25-28

b) Modifications to Test Standard

No modifications were made to the test standard.

K. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to NEC America upon completion of testing.

III. Electromagnetic Compatibility Criteria for Unintentional Radiators

Electromagnetic Compatibility Criteria

§ 15.107 Conducted Emissions Limits

Test Requirement(s): **15.107 (b)** For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in Table 7. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals. The lower limit applies at the band edges.

Frequency range (MHz)	Class A Conducted Limits (dBµV)		*Class B Conducted Limits (dBµV)	
	Quasi-Peak	Average	Quasi-Peak	Average
* 0.15- 0.45	79	66	66 - 56	56 - 46
0.45 - 0.5	79	66	56	46
0.5 - 30	73	60	60	50
Note 1 — The lower limit shall apply at the transition frequencies. Note 2 — The limit decreases linearly with the logarithm if the frequency in the range 0.15 MHz to 0.5 MHz. * -- Limits per Subsection 15.207(a).				

Table 7. Conducted Limits for Radio Frequency Devices calculated from FCC Part 15 Subsections 15.107(a) (b) and 15.207(a)

Test Results: The EUT was not applicable with the Class A requirement(s) of this section. The EUT is operated from a -48 VDC source.

Radiated Emission Limits

§ 15.109 Radiated Emissions Limits

Test Requirement(s): **15.109 (a)** Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the Class B limits expressed in Table 8.

15.109 (b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the Class A limits expressed in Table 8.

Frequency (MHz)	Field Strength (dBµV/m)	
	§15.109 (b), Class A Limit (dBµV) @ 10m	§15.109 (a),Class B Limit (dBµV) @ 3m
30 - 88	39.00	40.00
88 - 216	43.50	43.50
216 - 960	46.40	46.00
Above 960	49.50	54.00

Table 8. Radiated Emissions Limits calculated from FCC Part 15, §15.109 (a) (b)

Test Procedures: The EUT was placed on a turntable inside a semi-anechoic chamber. The method of testing and test conditions of ANSI C63.4 were used. An antenna was located 3 m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. Unless otherwise specified, measurements were made using a quasi-peak detector with a 120 kHz bandwidth.

Three configurations were tested. In each configuration, the IDU remained the same, but the ODU was different. The ODU variants were: Sub Band A Low, Sub Band B High, and Sub Band C High.

Test Results: The EUT was compliant with the Class A requirement(s) of this section. Measured emissions were below applicable limits.

Test Engineer(s): Len Knight

Test Date(s): 07/17/2008

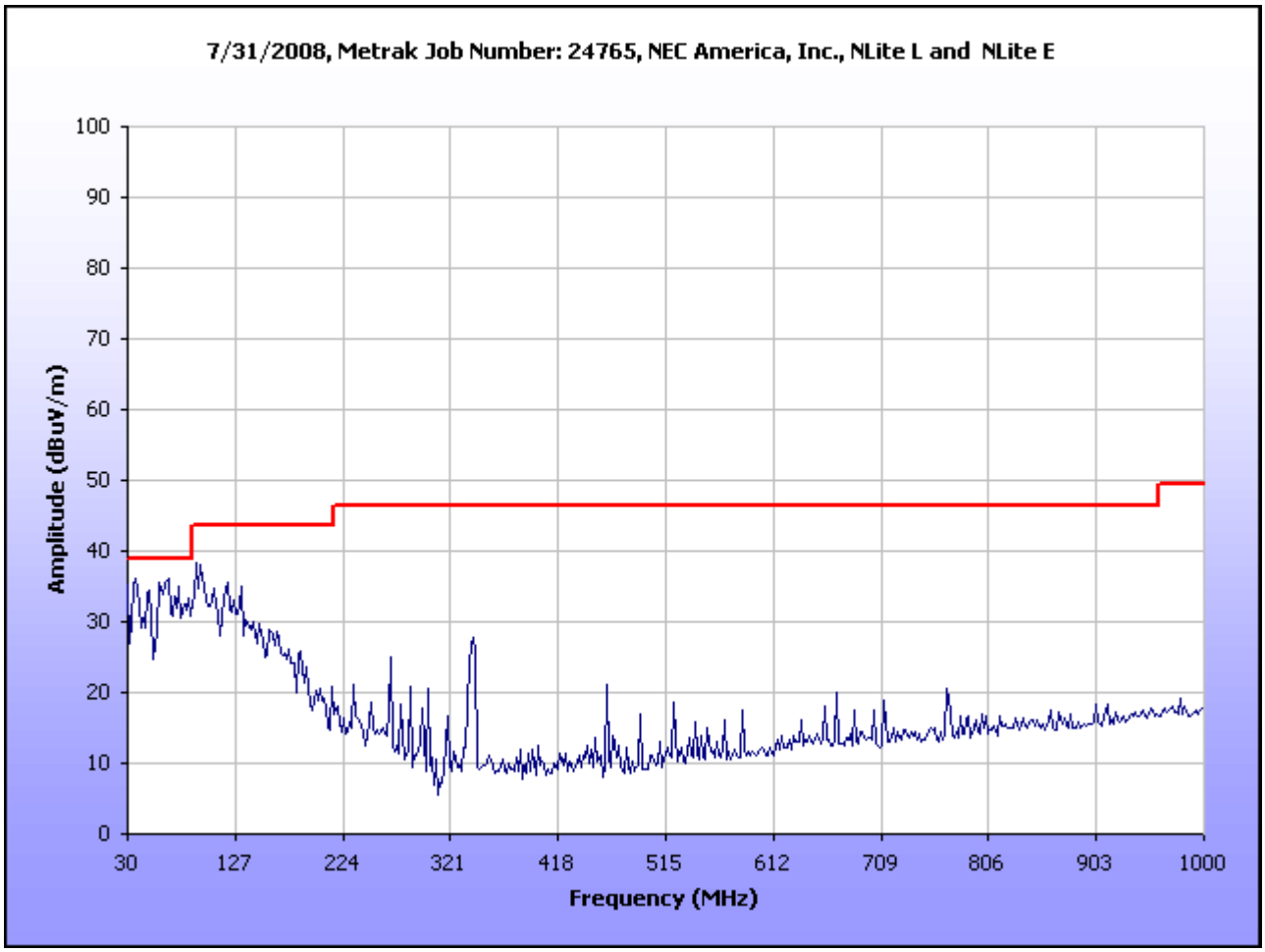
Radiated Emissions Limits Test Results

Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna Height (m)	Uncorrected Amplitude (dBuV)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.100	149	H	3.63	20.58	5.55	0.88	10.46	16.55	39.00	-22.45
30.100	276	V	1.00	36.24	4.15	0.88	10.46	30.81	39.00	-8.19
30.878	148	H	3.33	22.32	5.92	0.88	10.46	18.66	39.00	-20.34
30.878	293	V	1.00	40.43	4.52	0.88	10.46	35.37	39.00	-3.63
37.054	306	H	2.52	14.46	8.43	0.89	10.46	13.33	39.00	-25.67
37.054	238	V	1.02	34.25	7.20	0.89	10.46	31.88	39.00	-7.12
38.594	207	H	2.58	18.60	8.83	0.89	10.46	17.87	39.00	-21.13
*38.594	31	V	1.00	40.54	7.72	0.89	10.46	38.70	39.00	-0.30
40.155	175	H	2.81	17.78	9.21	0.90	10.46	17.43	39.00	-21.57
40.155	106	V	1.00	36.83	8.22	0.90	10.46	35.49	39.00	-3.51
49.412	351	H	3.03	19.81	9.76	1.02	10.46	20.13	39.00	-18.87
49.412	0	V	1.30	35.36	9.62	1.02	10.46	35.54	39.00	-3.46
84.918	11	H	2.48	35.42	6.61	1.19	10.46	32.76	39.00	-6.24
84.918	0	V	2.46	37.57	6.70	1.19	10.46	35.00	39.00	-4.00
95.725	359	H	1.82	35.74	7.71	1.21	10.46	34.21	43.50	-9.29
95.725	0	V	2.52	35.94	6.96	1.21	10.46	33.65	43.50	-9.85
98.818	349	H	1.96	37.07	7.78	1.23	10.46	35.62	43.50	-7.88
98.818	241	V	1.00	32.61	7.21	1.23	10.46	30.59	43.50	-12.91

Table 9. Radiated Emissions Limits Test Results, 30 MHz – 1GHz, FCC, Sub Band A Low

Note 1: * - At this frequency, the measured electric-field strength exhibits a margin of compliance that is less than 3 dB below the specification limit. We recommend that every emission measured, have at least a 3 dB margin to allow for deviations in the emission characteristics that may occur during the production process.

Note 2: The EUT was tested at 3 m. The data has been corrected for comparison with the 10 m limit using the formula: 20log (3 m/10 m) as expressed in the 'Distance Correction' column.



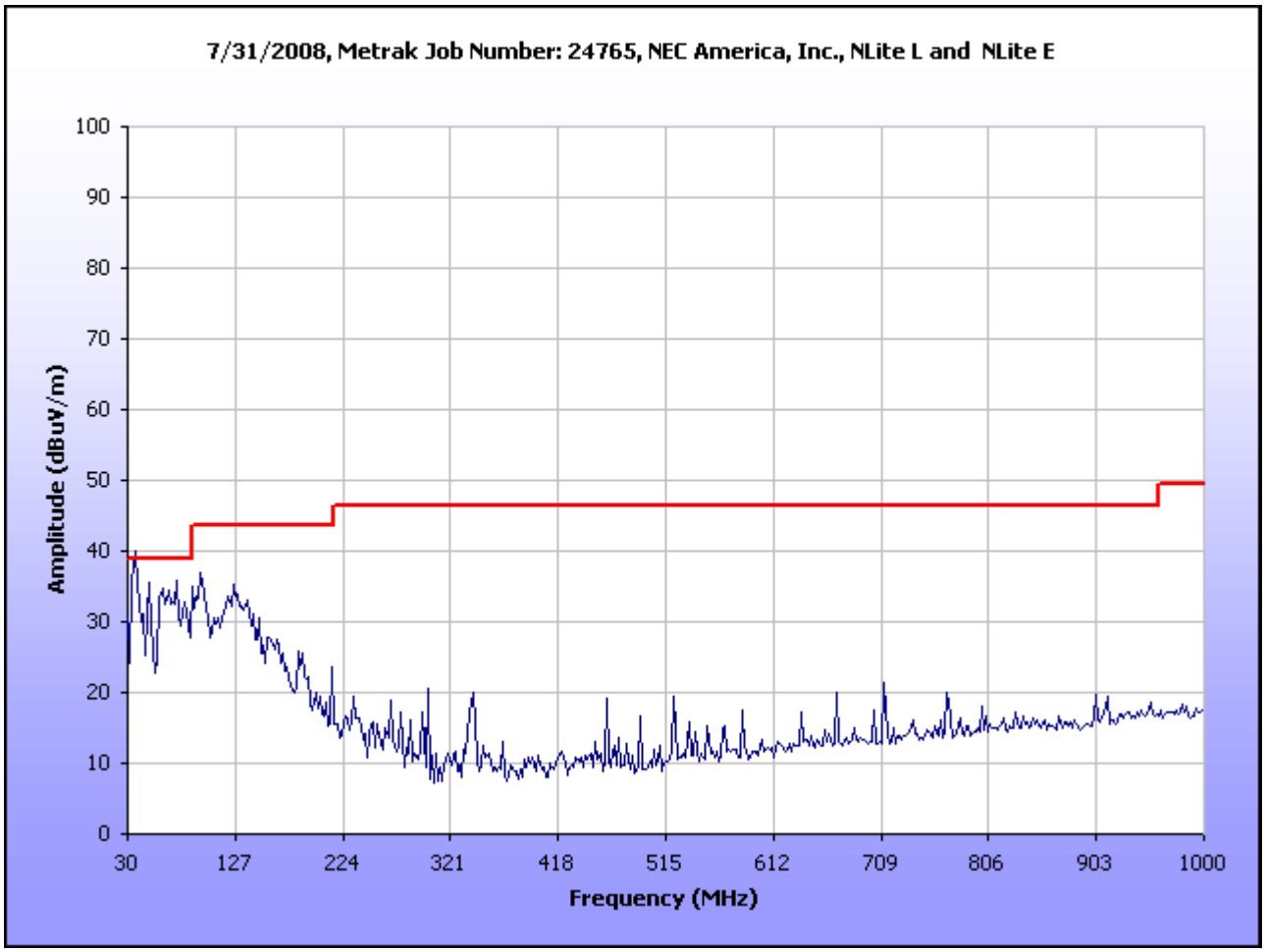
Plot 1. Radiated Emissions, Pre-Scan, Sub Band A Low

Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna Height (m)	Uncorrected Amplitude (dBuV)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
30.080	143	H	2.83	17.18	5.54	0.88	10.46	13.14	39.00	-25.86
30.080	324	V	1.00	34.95	4.14	0.88	10.46	29.51	39.00	-9.49
30.877	120	H	3.94	21.75	5.92	0.88	10.46	18.09	39.00	-20.91
30.877	325	V	1.00	40.42	4.52	0.88	10.46	35.36	39.00	-3.64
35.509	361	H	3.44	21.69	8.03	0.89	10.46	20.15	39.00	-18.85
35.509	359	V	1.00	36.25	6.67	0.89	10.46	33.35	39.00	-5.65
38.622	158	H	2.65	18.18	8.84	0.89	10.46	17.46	39.00	-21.54
*38.622	352	V	1.00	38.00	7.73	0.89	10.46	36.17	39.00	-2.83
40.155	166	H	3.12	15.19	9.21	0.90	10.46	14.84	39.00	-24.16
40.155	227	V	1.00	34.82	8.22	0.90	10.46	33.48	39.00	-5.52
60.205	1	H	2.59	29.64	10.40	1.05	10.46	30.64	39.00	-8.36
60.205	5	V	1.00	34.40	10.10	1.05	10.46	35.09	39.00	-3.91
61.775	187	H	2.22	26.88	10.44	1.06	10.46	27.91	39.00	-11.09
61.775	187	V	1.00	34.16	10.10	1.06	10.46	34.86	39.00	-4.14
64.865	172	H	3.44	23.80	10.50	1.07	10.46	24.90	39.00	-14.10
64.865	263	V	1.00	32.16	10.10	1.07	10.46	32.87	39.00	-6.13
66.383	185	H	3.58	27.70	10.25	1.07	10.46	28.56	39.00	-10.44
66.383	313	V	1.00	34.80	9.69	1.07	10.46	35.10	39.00	-3.90
80.292	225	H	2.71	25.21	7.45	1.19	10.46	23.39	39.00	-15.61
80.292	247	V	1.14	33.04	6.98	1.19	10.46	30.75	39.00	-8.25
81.823	-1	H	3.03	31.97	7.17	1.19	10.46	29.87	39.00	-9.13
81.823	18	V	1.00	34.42	6.89	1.19	10.46	32.04	39.00	-6.96
87.997	165	H	2.75	33.40	6.84	1.18	10.46	30.96	39.00	-8.04
87.997	264	V	2.85	31.43	6.64	1.18	10.46	28.79	39.00	-10.21
89.550	5	H	3.26	32.10	6.96	1.18	10.46	29.79	43.50	-13.71
89.550	227	V	2.81	33.07	6.61	1.18	10.46	30.40	43.50	-13.10
95.728	193	H	2.38	35.88	7.71	1.21	10.46	34.35	43.50	-9.15
95.728	3	V	2.50	37.30	6.96	1.21	10.46	35.01	43.50	-8.49
131.242	226	H	2.68	27.59	7.55	1.31	10.46	25.99	43.50	-17.51
131.242	289	V	1.37	33.05	7.93	1.31	10.46	31.82	43.50	-11.68

Table 10. Radiated Emissions Limits Test Results, 30 MHz – 1GHz, FCC, Sub Band B High

Note 1: * - At this frequency, the measured electric-field strength exhibits a margin of compliance that is less than 3 dB below the specification limit. We recommend that every emission measured, have at least a 3 dB margin to allow for deviations in the emission characteristics that may occur during the production process.

Note 2: The EUT was tested at 3 m. The data has been corrected for comparison with the 10 m limit using the formula: 20log (3 m/10 m) as expressed in the 'Distance Correction' column.



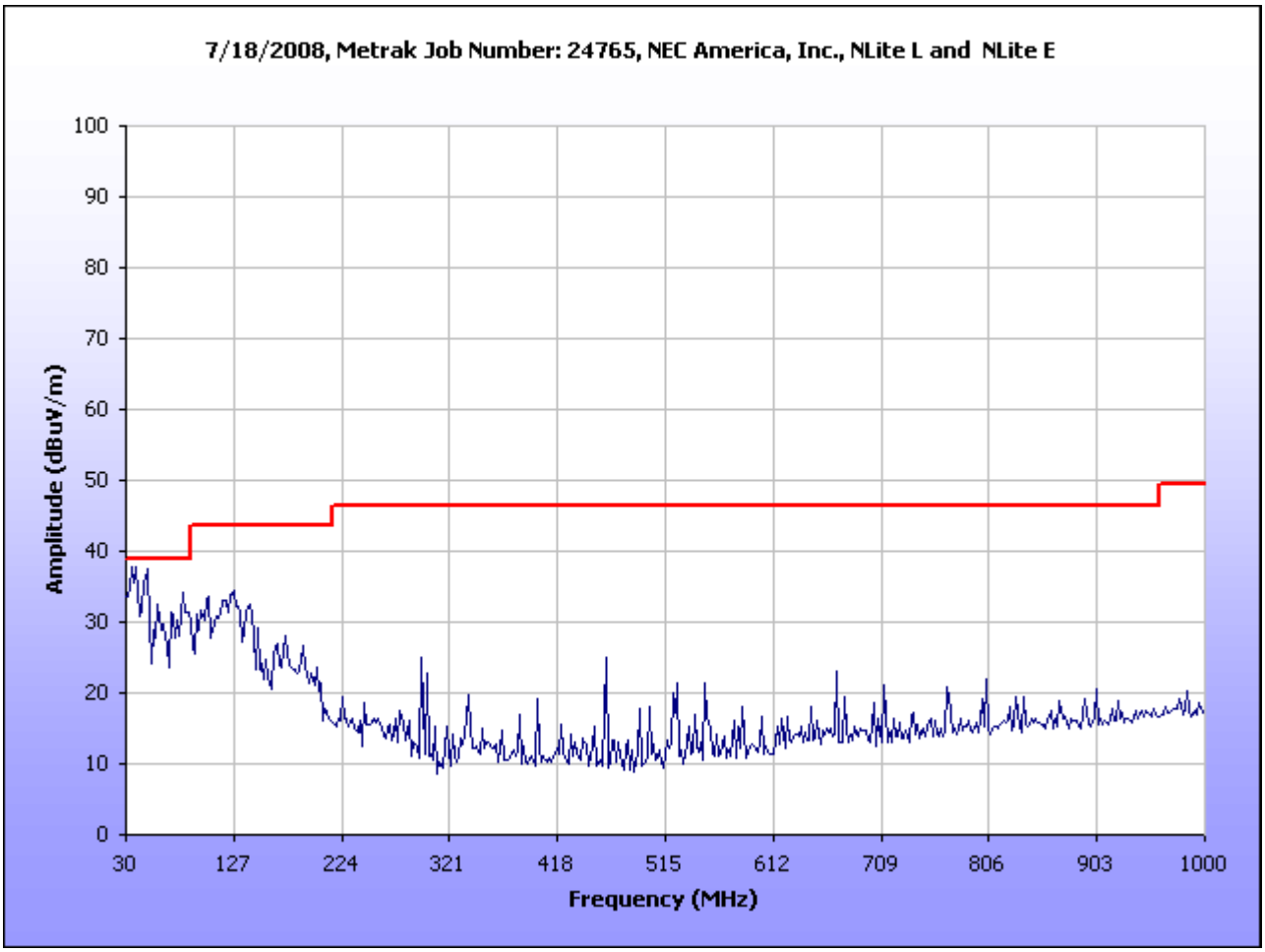
Plot 2. Radiated Emissions, Pre-Scan, Sub Band B High

Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna Height (m)	Uncorrected Amplitude (dBuV)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
32.465	181	H	3.14	19.55	6.68	0.88	10.46	16.66	39.00	-22.34
32.465	352	V	1.00	32.24	5.28	0.88	10.46	27.95	39.00	-11.05
35.511	330	H	2.01	15.44	8.03	0.89	10.46	13.90	39.00	-25.10
*35.511	147	V	1.09	40.11	6.67	0.89	10.46	37.21	39.00	-1.79
37.054	218	H	3.98	23.00	8.43	0.89	10.46	21.87	39.00	-17.13
*37.054	253	V	1.01	39.41	7.20	0.89	10.46	37.04	39.00	-1.96
38.626	-1	H	2.84	21.34	8.84	0.89	10.46	20.62	39.00	-18.38
38.626	83	V	1.00	36.33	7.73	0.89	10.46	34.50	39.00	-4.50
40.135	24	H	2.88	25.40	9.21	0.90	10.46	25.05	39.00	-13.95
*40.135	137	V	1.17	37.89	8.22	0.90	10.46	36.55	39.00	-2.45
49.406	362	H	3.43	25.29	9.76	1.02	10.46	25.61	39.00	-13.39
*49.406	0	V	1.00	38.40	9.62	1.02	10.46	38.58	39.00	-0.42
81.835	0	H	2.35	34.30	7.17	1.19	10.46	32.20	39.00	-6.80
81.835	270	V	1.00	35.15	6.89	1.19	10.46	32.77	39.00	-6.23
81.841	190	H	2.60	33.03	7.17	1.19	10.46	30.93	39.00	-8.07
81.841	285	V	1.00	35.33	6.89	1.19	10.46	32.95	39.00	-6.05
84.917	0	H	2.69	30.46	6.61	1.19	10.46	27.80	39.00	-11.20
84.917	118	V	1.00	31.45	6.70	1.19	10.46	28.88	39.00	-10.12
88.030	185	H	2.45	35.23	6.84	1.18	10.46	32.80	43.50	-10.70
88.030	-2	V	1.08	30.00	6.64	1.18	10.46	27.36	43.50	-16.14
125.079	0	H	1.45	33.62	7.40	1.31	10.46	31.87	43.50	-11.63
125.079	121	V	1.01	35.82	7.90	1.31	10.46	34.57	43.50	-8.93

Table 11. Radiated Emissions Limits Test Results, 30 MHz – 1GHz, FCC, Sub Band C High

Note 1: * - At this frequency, the measured electric-field strength exhibits a margin of compliance that is less than 3 dB below the specification limit. We recommend that every emission measured, have at least a 3 dB margin to allow for deviations in the emission characteristics that may occur during the production process.

Note 2: The EUT was tested at 3 m. The data has been corrected for comparison with the 10 m limit using the formula: 20log (3 m/10 m) as expressed in the 'Distance Correction' column.



Plot 3. Radiated Emissions, Pre-Scan, Sub Band C High

Radiated Emission Limits Test Setup

Photograph 1. Radiated Emission Test Setup

IV. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.203 Antenna Requirement

Test Requirement: **§ 15.203:** An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

a.) Antenna must be permanently attached to the unit.

b.) Antenna must use a unique type of connector to attach to the EUT.

c.) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Results: The EUT as tested meets the criteria of this rule: The EUT and the antenna are intended for professional installation. The EUT is therefore compliant with §15.203.

Gain/Model	Manufacturer
30 dBi P2F-52 Parabolic Antenna	Andrew

Test Engineer(s): Len Knight

Test Date(s): 09/08/08

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.207 Conducted Emissions Limits

Test Requirement(s): **§ 15.207 (a):** For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency range (MHz)	§ 15.207(a), Conducted Limit (dBμV)	
	Quasi-Peak	Average
* 0.15- 0.45	66 - 56	56 - 46
0.45 - 0.5	56	46
0.5 - 30	60	50

Table 12. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)

Test Results: The EUT was not applicable with the requirement(s) of this section. Measured emissions were below applicable limits. The EUT is operated from a -48 VDC source.

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(a) 6 dB and 99% Bandwidth

Test Requirements: **§ 15.247(a):** Operation under the provisions of this section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

For systems using digital modulation techniques, the EUT may operate in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

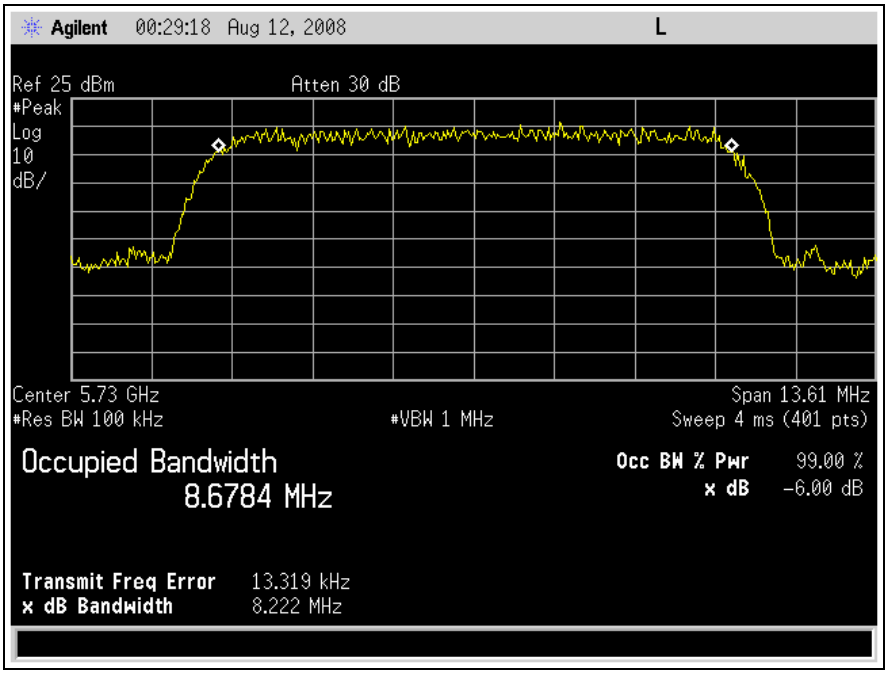
Test Results The EUT was compliant with the requirement(s) of § 15.247 (a).

Test Engineer(s): Len Knight

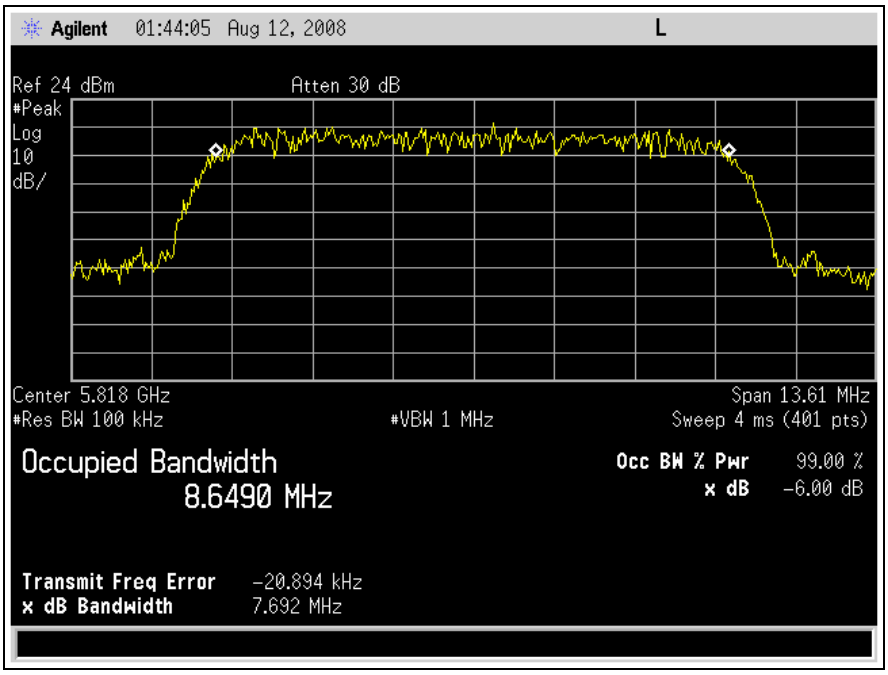
Test Date(s): 08/11/2008

Mode Tested	Band	Frequency (GHz)	Measured 6 dB Bandwidth (MHz)	Test Limit (kHz)
Nlite L	LOW	5.73	8.222	>=500
	MID	5.818	7.692	>=500
	HIGH	5.845	8.181	>=500

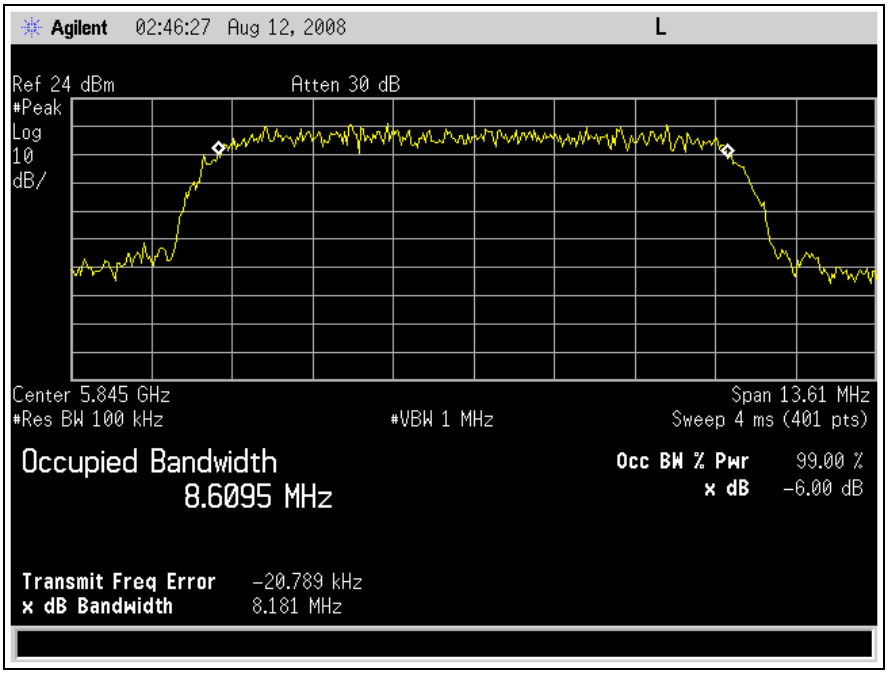
Table 13. 6 dB Occupied Bandwidth, Test Results



Plot 4. 6 dB Occupied Bandwidth, Low Channel



Plot 5. 6 dB Occupied Bandwidth, Mid Channel



Plot 6. 6 dB Occupied Bandwidth, High Channel

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(b) Peak Power Output and RF Exposure

Test Requirements: **§15.247(b):** The maximum peak output power of the intentional radiator shall not exceed the following:

Digital Transmission Systems (MHz)	Output Limit (Watts)
902-928	1.000
2400–2483.5	1.000
5725– 5850	1.000

Table 14. Output Power Requirements from §15.247

§15.247(c): if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in the Table 14, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400 – 2483.5 MHz band may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Fixed, point-to-point operation excludes the use of point-to-multipoint systems, omni-directional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

Test Procedure: The transmitter was connected to a calibrated Spectrum Analyzer. Cable loss was programmed into Spectrum Analyzer. The EUT was measured at the low, mid and high channels of each band at a data rate which gave the maximum power level.

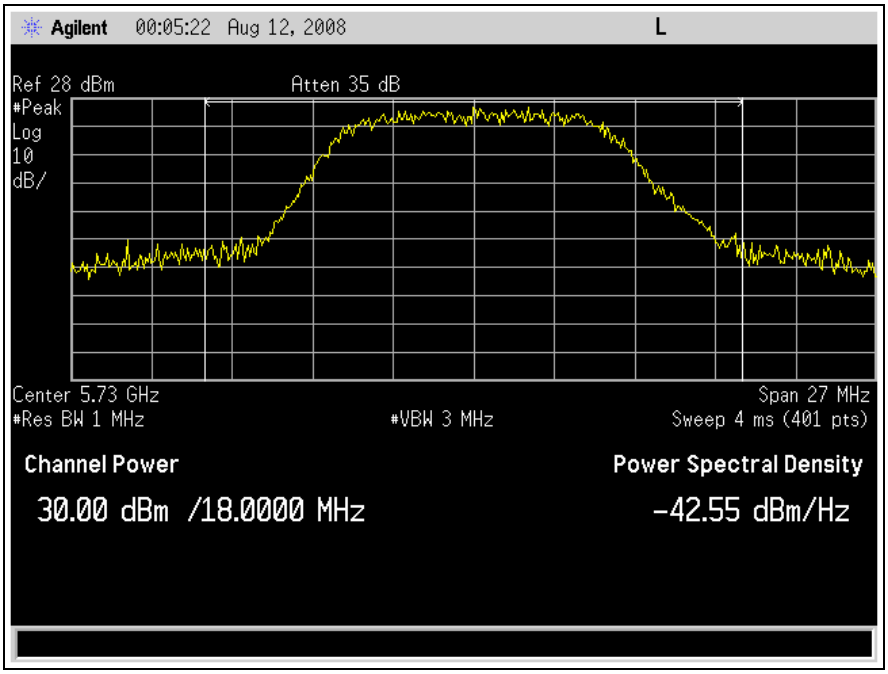
Test Results: Equipment complies with the Peak Power Output limits of **§ 15.247(b)**.

Mode Tested	Band	Frequency (GHz)	Measured Power (dBm)	Test Limit (dBm)
Nlite L	LOW	5.73	30	30
	MID	5.818	29.98	30
	HIGH	5845	29.61	30

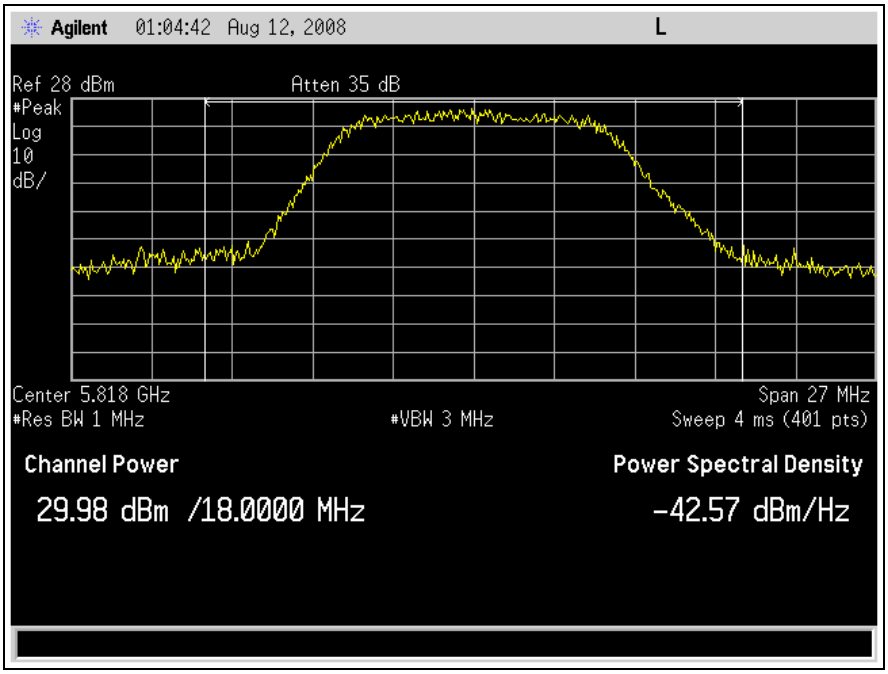
Table 15. RF Output Power Test Results

Test Engineer(s): Len Knight

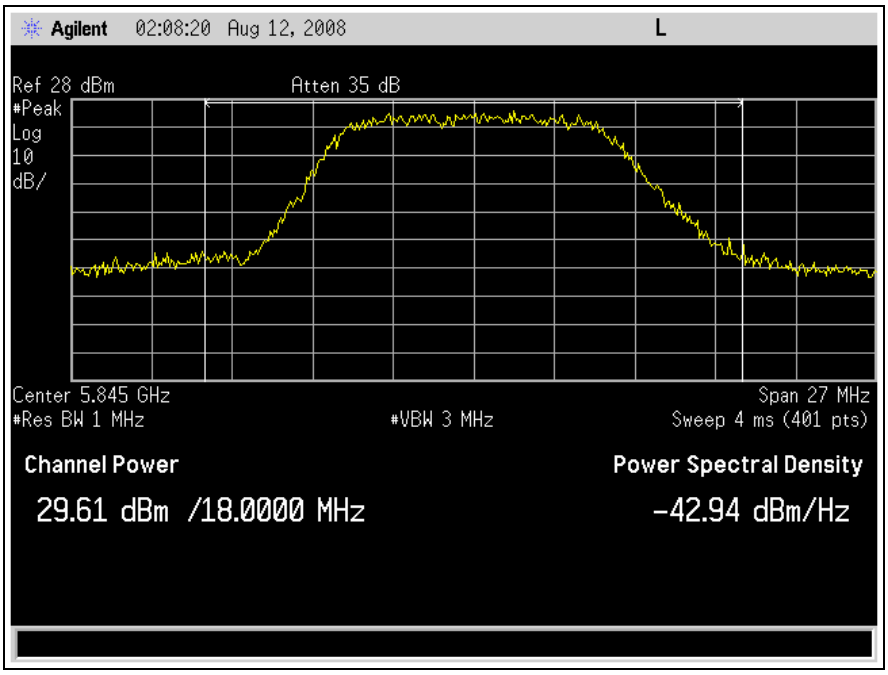
Test Date(s): 08/11/2008



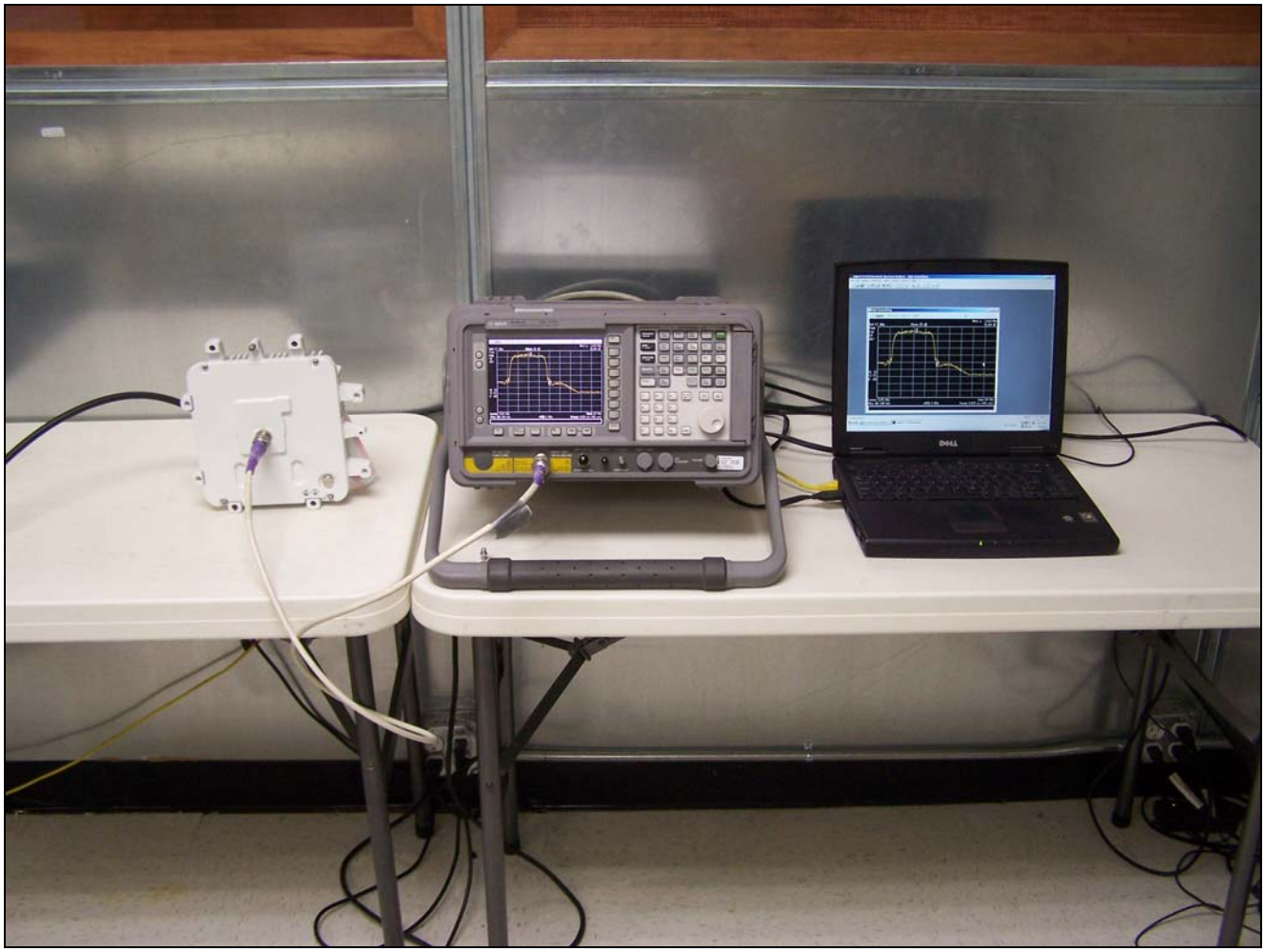
Plot 7. RF Output Power, Low Channel



Plot 8. RF Output Power, Mid Channel



Plot 9. RF Output Power, High Channel



Photograph 2. RF Output Power, Test Setup

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(b) Peak Power Output and RF Exposure

RF Exposure Requirements: **§1.1307(b)(1) and §1.1307(b)(2):** Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

RF Radiation Exposure Limit: **§1.1310:** As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

MPE Limit Calculation: EUT's operating frequencies @ **5725 - 5850**; highest conducted power = 30.0 dBm (peak) therefore, Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2

EUT maximum antenna gain =**30 dBi.**

where, S = Power Density (1 mW/cm^2)
P = Power Input to antenna (1000.0mW)
G = Antenna Gain (1000 numeric)

$S = (1000*1000/ 4*3.14*20^2) = (1000000 /5024) =$ **198.94 mW/cm^2**

Calculating for R

$R = \sqrt{PG / 4\pi S}$

$R = \sqrt{(1000*1000)} / 4\pi(1)$

R = **282.1 cm**

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(d) Harmonic Emissions – Radiated and Conducted

Test Requirements: **§15.247(d)**; **§15.205, §15.209:** Emissions outside the frequency band.

§15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a).

§15.205(a): Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090–0.110----------	16.42–16.423	399.9–410	4.5–5.15
[1] 0.495–0.505----------	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905----------	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128----------	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775----------	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775----------	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218----------	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825----------	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225----------	123–138	2200–2300	14.47–14.5
8.291–8.294----------	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366----------	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675----------	156.7–156.9	2655–2900	22.01–23.12
8.41425–8.41475----------	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293----------	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025----------	240–285	3345.8–3358 36.	43–36.5
12.57675–12.57725----------	322–335.4	3600–4400	([2])

Table 16. Restricted Bands of Operation

[1] Until February 1, 1999, this restricted band shall be 0.490 – 0.510 MHz.
[2] Above 38.6

Test Procedure: For intentional radiators with a digital device portion which operates below 10 GHz, the spectrum was investigated as per §15.33(a)(1) and §15.33(a)(4); i.e., the lowest RF signal generated or used in the device up to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

In accordance with §15.35(b) the limit on the radio frequency emissions as measured using instrumentation with a peak detector function shall be 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules.

For radiated emissions measurements above 1 GHz, a Resolution Band Width of 1 MHz was used.

Test Results: The EUT was compliant with the Radiated Emission limits of **§15.247(d)**; **§15.205, §15.209** for Intentional Radiators. See following pages for detailed test results.

Test Engineer(s): Len Knight

Test Date(s): 09/02/2008

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(d) Harmonic Emissions Requirements – Radiated

Frequency (MHz)	Receiver Antenna Polarity (H/V)	Corrected Field Strength @ 3m (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dB)	Measurement Type
11460	V	41.3	74	32.7	pk
11460	V	30.6	54	23.5	avg
17190	V	47.7	74	26.3	pk
17190	V	37.4	54	16.6	avg

Table 17. Harmonic Emissions Test Results – Low Channel, 5730 MHz

Frequency (MHz)	Receiver Antenna Polarity (H/V)	Corrected Field Strength @ 3m (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dB)	Measurement Type
11636	V	41.4	74	32.6	pk
11636	V	30.8	54	23.2	avg
17454	V	49.5	74	24.5	pk
17454	V	39.0	54	15.0	avg

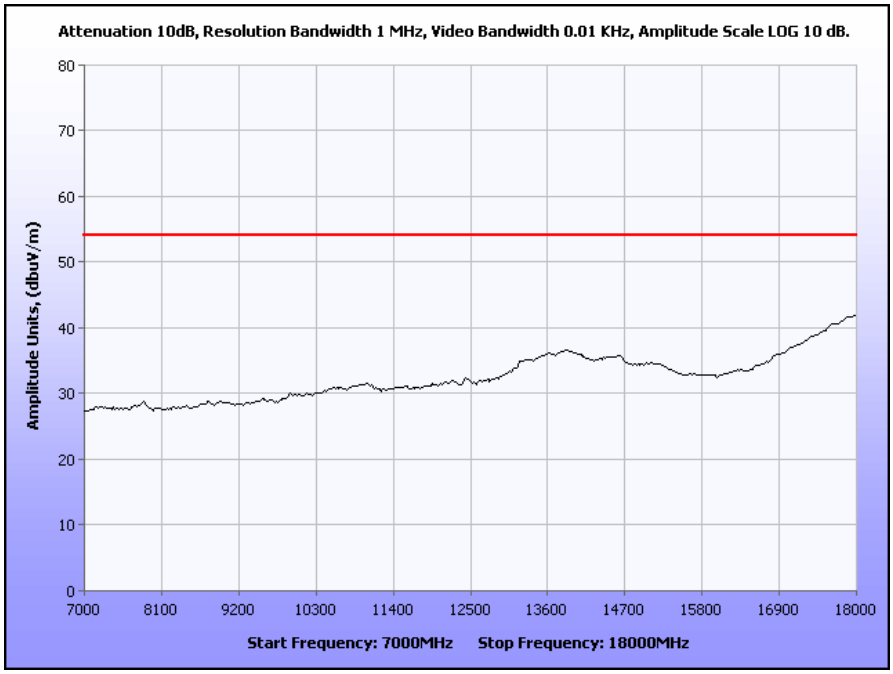
Table 18. Harmonic Emissions Test Results – Mid Channel, 5818 MHz

Frequency (MHz)	Receiver Antenna Polarity (H/V)	Corrected Field Strength @ 3m (dBµV/m)	Limit @ 3m (dBµV/m)	Margin (dB)	Measurement Type
11690	V	43.0	74	31.0	pk
11690	V	30.9	54	23.1	avg
17535	V	51.6	74	22.4	pk
17535	V	39.6	54	14.4	avg

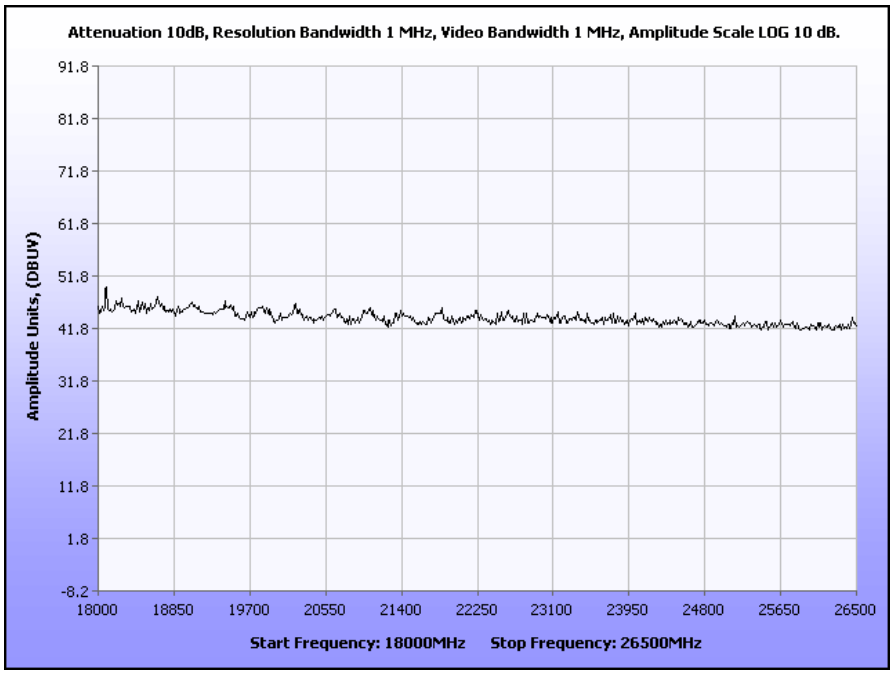
Table 19. Harmonic Emissions Test Results – High Channel, 5845 MHz

No detectable emissions were measured above 18 GHz.

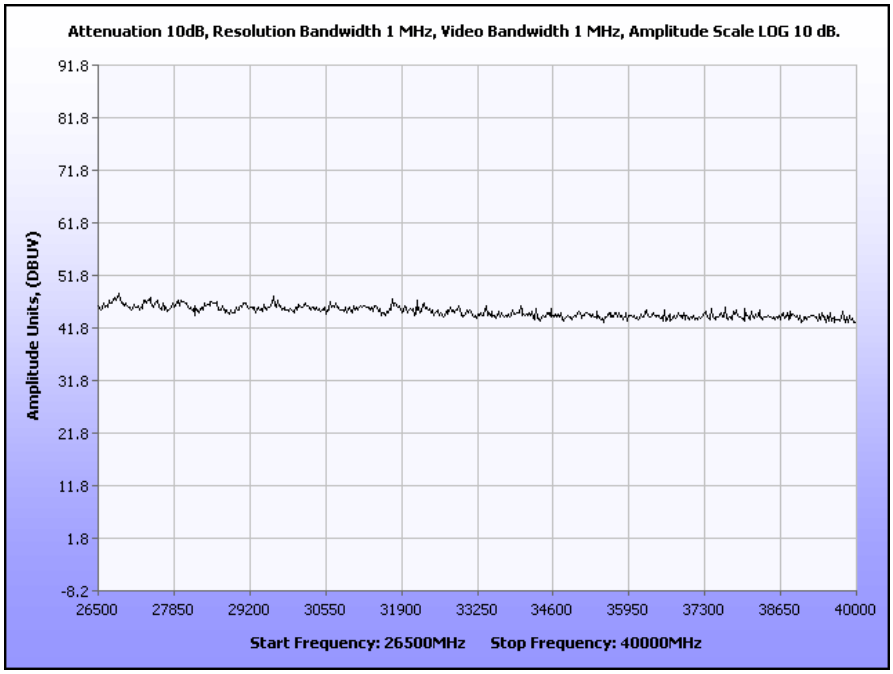
Electromagnetic Compatibility Criteria for Intentional Radiators
§ 15.247(d) Radiated Spurious Emissions Requirements



Plot 10. Radiated Spurious, Mid Peak, 7 GHz – 18 GHz



Plot 11. Radiated Spurious, Mid Peak, 18GHz – 26.5GHz



Plot 12. Radiated Spurious, Mid Peak, 26.5GHz – 40GHz

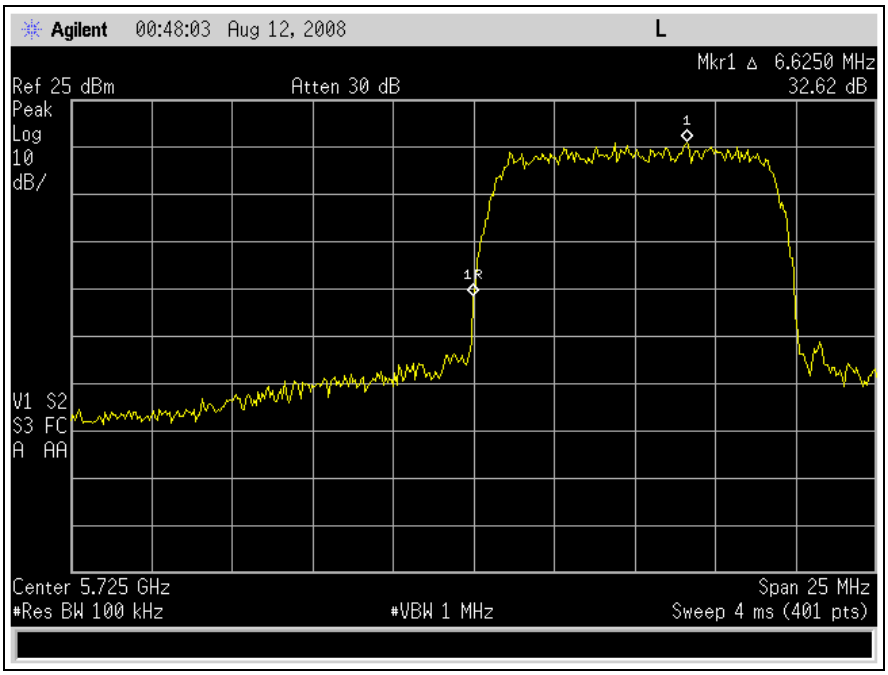
Photograph 3. Radiated Harmonic Spurious, Test Setup

Electromagnetic Compatibility Criteria for Intentional Radiators
§ 15.247(d) Restricted Band Requirements

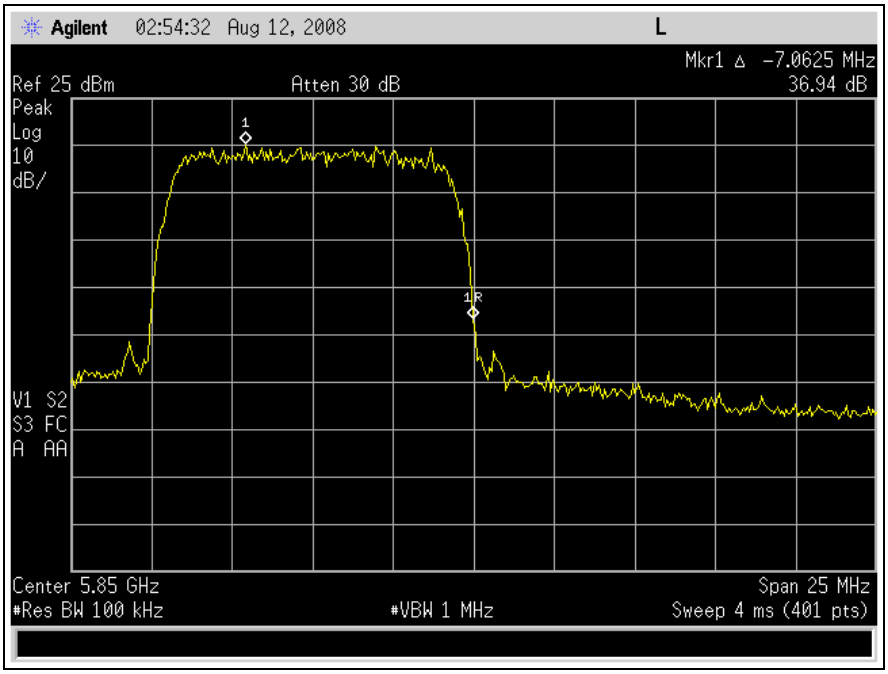
Note: All corrections have been accounted for in plots:

Mode Tested	Band	Measured (dBc)	Test Limit (dBc)
Nlite L	LOW	32.62	20
	HIGH	36.94	20

Table 20. Conducted Band Edge, Test Results



Plot 13. Conducted Band Edge, Low Channel



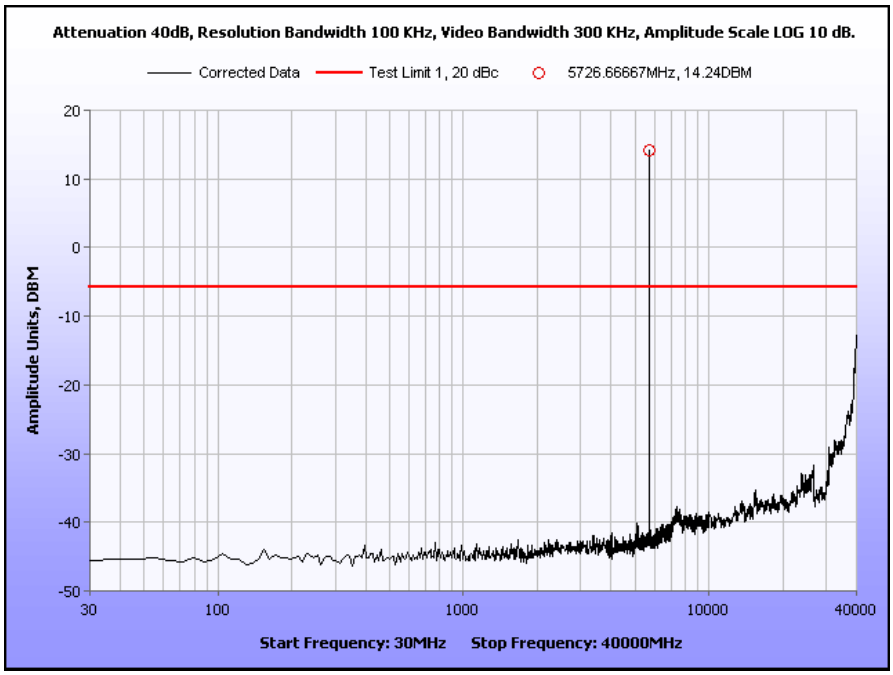
Plot 14. Conducted Band Edge, High Channel

Electromagnetic Compatibility Criteria for Intentional Radiators

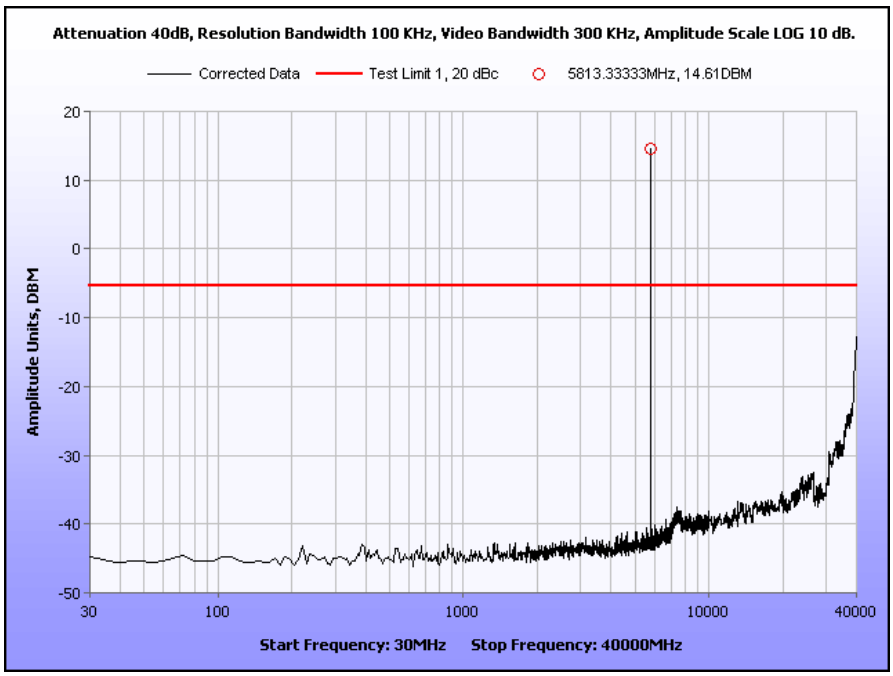
§ 15.247(d) Spurious Emissions Requirements –RF Conducted

Mode Tested	Band	Frequency (GHz)	Test Limit (20 dBc)
Nlite L	LOW	5.73	20
	MID	5.818	20
	HIGH	5.845	20

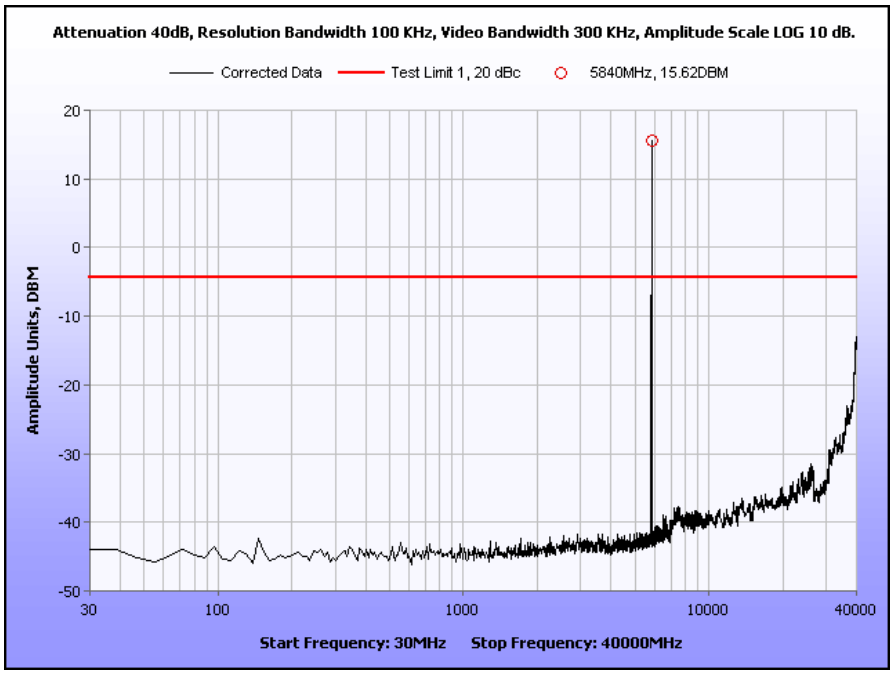
Table 21. RF Conducted Spurious Emissions, Test Results



Plot 15. RF Conducted Spurious Emissions, Low Channel



Plot 16. RF Conducted Spurious Emissions, Mid Channel



Plot 17. RF Conducted Spurious Emissions, High Channel

Electromagnetic Compatibility Criteria for Intentional Radiators

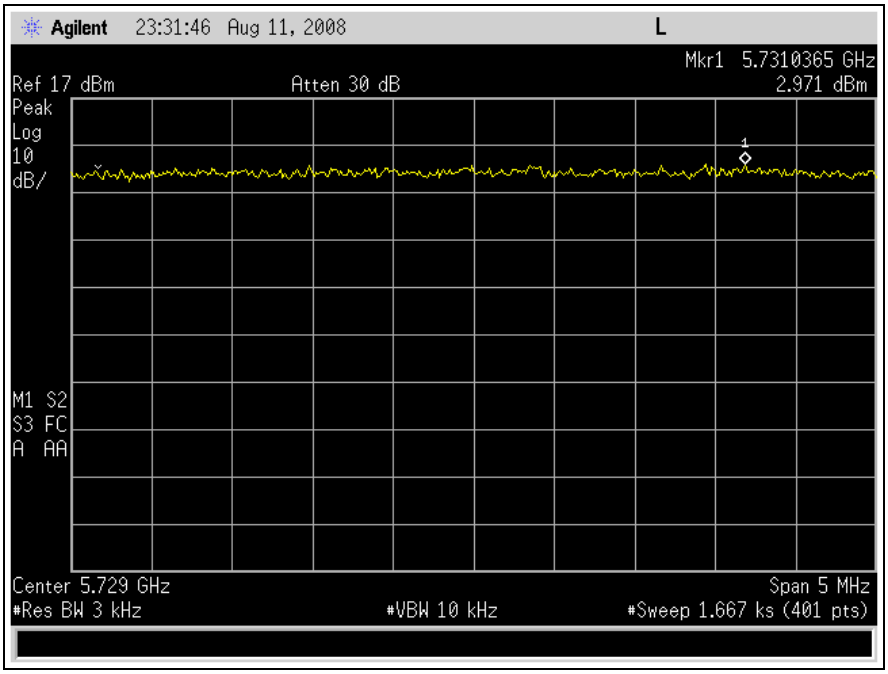
§ 15.247(e) Peak Power Spectral Density

Test Requirements: **§15.247(e):** For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

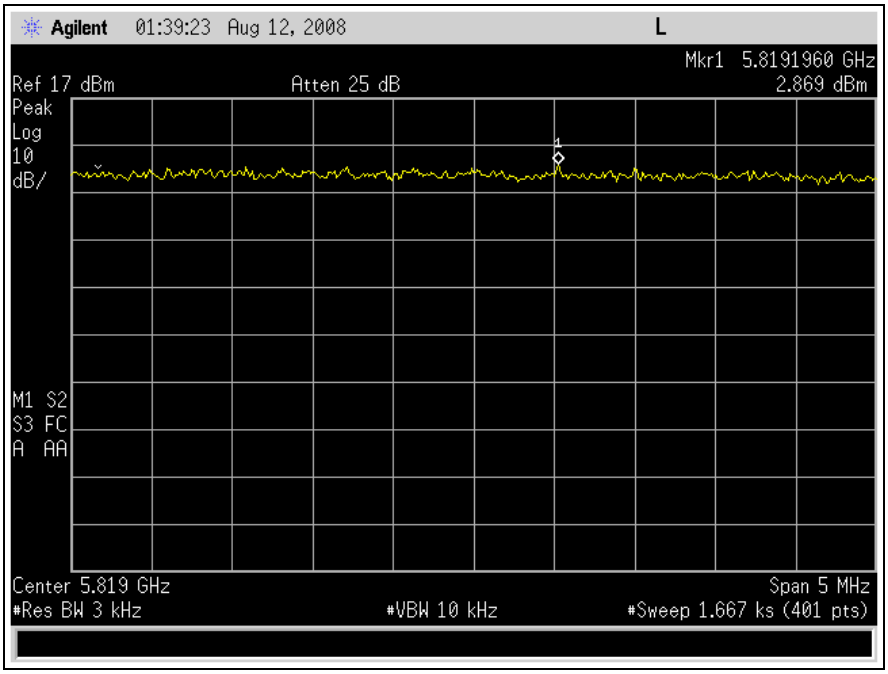
Test Results: Equipment was compliant with the peak power spectral density limits of **§ 15.247 (e)**.

Mode Tested	Band	Measured Peak Power Spectral Density (dBm)	Test Limit (dBm)
NLite L	LOW	2.971	8
	MID	2.869	8
	HIGH	2.304	8

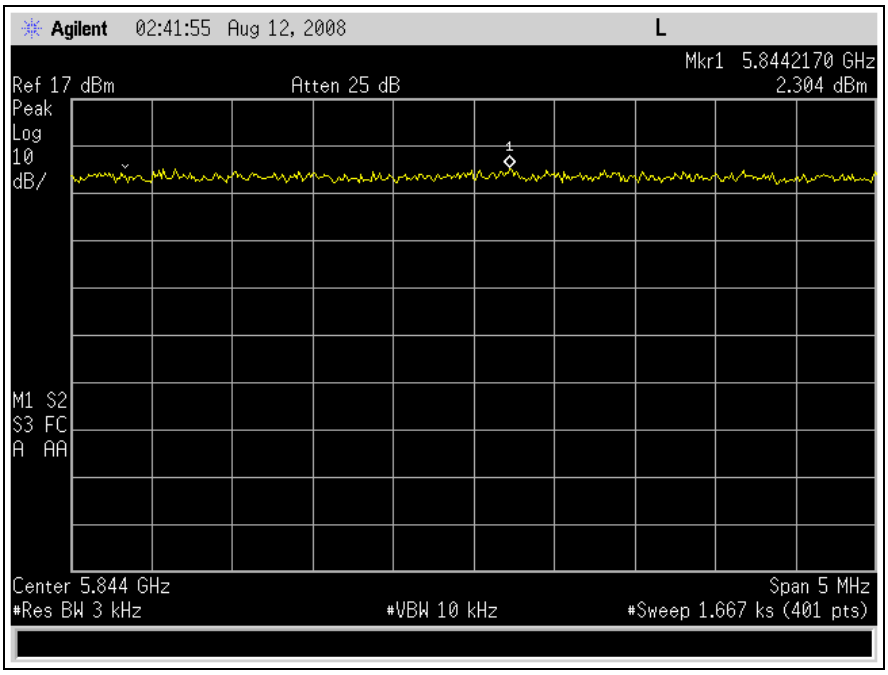
Table 22. Peak Power Spectral Density, Test Results



Plot 18. Peak Power Spectral Density, Low Channel



Plot 19. Peak Power Spectral Density, Mid Channel



Plot 20. Peak Power Spectral Density, High Channel

IV. Test Equipment

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ANSI/NCSL Z540-1-1994 and ANSI/ISO/IEC 17025:2000.

MET #	Equipment	Manufacturer	Model	Cal Date	Cal Due
1T4300	SEMI-ANECHOIC CHAMBER # 1	EMC TEST SYSTEMS	NONE	02/17/2006	01/17/2009
1T2511	ANTENNA; HORN	EMCO	3115	07/29/2008	07/29/2009
1T4080	SPECTRUM ANALYZER W/ MEMORY MODULE	HEWLETT PACKARD	8563A	09/28/2007	09/28/2008
1T4592	RF FILTER KIT	VARIOUS	N/A	SEE NOTE	
1T4442	PRE-AMPLIFIER, MICROWAVE	MITEQ	AFS42-01001800-30-10P	SEE NOTE	
RENTAL	PSA SERIES SPECTRUM ANALYZER	AGILENT	E4440A	02/28/2008	02/28/2009
1T4303	ANTENNA; BILOG	SCHAFNER – CHASE EMC	CBL6140A	07/07/2008	07/07/2009
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	04/18/2008	04/18/2009

Table 23. Test Equipment List – Radiated Emissions 15.109, 205, 209

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

V. Certification & User's Manual Information

Certification & User's Manual Information

A. Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

§ 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of Emitting radio-frequency energy by radiation, conduction, or other means. Radio- frequency devices include, but are not limited to:

(a) The various types of radio communication transmitting devices described throughout this chapter.

(b) The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.

(c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.

(d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

§ 2.803 Marketing of radio frequency devices prior to equipment authorization.

(a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:

(1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or

(2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.

(d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.

(e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:

(i) Compliance testing;

(ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or

(v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.

(e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.

(f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.

Certification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart J — Equipment Authorization Procedures:

§ 2.901 Basis and Purpose

(a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.[1] *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer*, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.

(b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant.

§ 2.907 Certification.

(a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.

(b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

[1] In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.

Certification & User's Manual Information

§ 2.948 Description of measurement facilities.

(a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.

(1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.

(i) If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.

(ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.

(2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.

Certification & User's Manual Information

Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

§ 15.19 Labeling requirements.

(a) In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

§ 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Verification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

§ 15.105 Information to the user.

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.

– Increase the separation between the equipment and receiver.

– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

– Consult the dealer or an experienced radio/TV technician for help.

ICES-003 Procedural & Labeling Requirements

From the Industry Canada Electromagnetic Compatibility Advisory Bulletin entitled, "Implementation and Interpretation of the Interference-Causing Equipment Standard for Digital Apparatus, ICES-003" (EMCAB-3, Issue 2, July 1995):

> "At present, CISPR 22: 2002 and ICES technical requirements are essentially equivalent. Therefore, if you have CISPR 22: 2002 approval by meeting CISPR Publication 22, the only additional requirements are: to attach a note to the report of the test results for compliance, indicating that these results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations; to maintain these records on file for the requisite five year period; and to provide the device with a notice of compliance in accordance with ICES-003."

Procedural Requirements:

According to Industry Canada's Interference Causing Equipment Standard for Digital Apparatus ICES-003 Issue 4, February 2004:

Section 6.1: A record of the measurements and results, showing the date that the measurements were completed, shall be retained by the manufacturer or importer for a period of at least five years from the date shown in the record and made available for examination on the request of the Minister.

Section 6.2: A written notice indicating compliance must accompany each unit of digital apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus. Where because of insufficient space or other constraints it is not feasible to affix a label to the apparatus, the notice may be in the form of a statement in the user's manual.

Labeling Requirements:

The suggested text for the notice, in English and in French, is provided below, from the Annex of ICES-003:

> This Class [2] digital apparatus complies with Canadian ICES-003.
>
> Cet appareil numérique de la classe [1] est conforme à la norme NMB-003 du Canada.

[2] Insert either A or B but not both as appropriate for the equipment requirements.

End of Report

