FCC PART 15 SUBPART C

EMI MEASUREMENT AND TEST REPORT

For

AMBIT Microsystems Corporation

4-1, Ming Shen Street, Tu Chen Industrial District.
Tu Chen, Taipei Hsien 236, Taiwan, R.O.C.

FCC ID: MCLT60H556

September 30, 2002

This Report Concerns:	**Equipment Type:**
☒ Original Report	Wireless LAN Card

Test Engineer:	Benjamin Jing
Report No.:	R0209052
Test Date:	September 14, 2002
Reviewed By:	Jeff Lee
Prepared By:	Bay Area Compliance Laboratory Corporation 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732 9164

TABLE OF CONTENTS

1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	AMBIT Microsystems Corporation
Product:	Wireless LAN Card
Model Name:	T60H556
Dimension:	4.6"L x 2.1" M
FCC ID:	MCLT60H556
Peak Output Power:	13.24 dBm (21.08 mW)
Frequency Range:	2.4 ~2.483GHz
Power Supply:	HP AC Adapter, M/N: HPF1781A
Applicable Standard:	FCC Part 15.247

** The test data was good for test sample only. It may have deviation for other product samples.*

1.2 Objective

This type approval report is prepared on behalf of. *Ambit Microsystems Corporation* in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules for Output Power, Antenna Requirements, 6 dB Bandwidth, power density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Spurious Radiated Emission, and processing gain.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals.

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2000, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2000.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, IEC/CISPR 22: 2002, and AS/NZS CISPR 22: 2002: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

1.6 Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Due Date
HP	Spectrum Analyzer	8568B	2610A02165	12/6/02
HP	Spectrum Analyzer	8593B	2919A00242	12/20/02
HP	Amplifier	8349B	2644A02662	12/20/02
HP	Quasi-Peak Adapter	85650A	917059	12/6/02
HP	Amplifier	8447E	1937A01046	12/6/02
A.H. System	Horn Antenna	SAS0200/571	261	12/27/02
Com-Power	Log Periodic Antenna	AL-100	16005	11/2/02
Com-Power	Biconical Antenna	AB-100	14012	11/2/02
Solar Electronics	LISN	8012-50-R-24-BNC	968447	12/28/02
Com-Power	LISN	LI-200	12208	12/20/02
Com-Power	LISN	LI-200	12005	12/20/02
BACL	Data Entry Software	DES1	0001	12/20/02

*** Statement of Traceability: Bay Area Compliance Laboratory Corp.** certifies that all calibration has been performed using suitable standards traceable to the NATIONAL INSTITUTE of STANDARDS and TECHNOLOGY (NIST).

1.7 Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
HP	Notebook PC	KT5	N/A	DoC

1.8 Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
HP	Notebook PC	KT5	N/A	DoC
Citizen	Printer	LSP-10	5047999-82	DLK66TLSP-10
EVERX	Modem	EV-945	N/A	E3E5UVEV-945

1.9 External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
Shielded Serial Cable	1.5	Serial Port/Laptop	Modem
Shielded Printer Cable	2.0	Parallel Port/Laptop	Printer

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The host system was configured for testing in a typical fashion (as a normally used by a typical user).

The EUT was tested in the normal (native) operating mode to represent *worst*-case results during the final qualification test.

2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the system components in a manner similar to a typical use. The test software, AT76C502A-RFMD Test Utility, provided by the customer, is started the Windows terminal program under the Windows 98/2000/ME/XP operating system.

Once loaded, the program sequentially exercises each system component, and the RFMD Test Utility icon appears in the PC screen. By the icon, select the channel to be tested, adjust the Test Utility's "TX Power" to 3F for the maximum RF output power. After the setting, click the "Continuous TX" button for transmitting the RF power.

Repeat above steps for other channel to be tested.

2.3 Special Accessories

As shown in section 2.7, all interface cables used for compliance testing are shielded. The host pc and the peripherals featured shielded metal connectors.

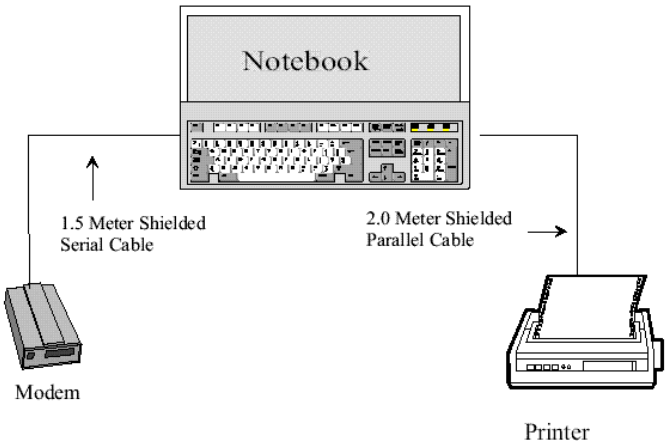
2.4 Schematics / Block Diagram

Please refer to Exhibit D.

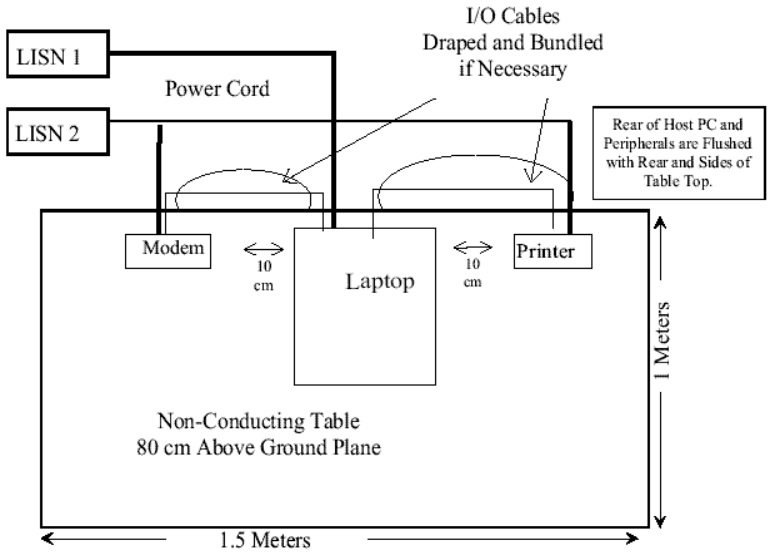
2.5 Equipment Modifications

No modifications were made by BACL Corporation to ensure the EUT to comply with the applicable limits and requirements.

2.6 Configuration of Test System



2.7 Test Setup Block Diagram



3 - SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT	REFERENCE
§15.203	Antenna Requirement	Compliant	Section 9 Appendix F
§ 15.205	Restricted Bands	Compliant	Section 6
§15.207 (a)	Conducted Emission	Compliant	Section 11
§15.209 (a)	Radiated Emission	Compliant	Section 10
§15.209 (f)	Spurious Emission	Compliant	Section 6 Appendix B
§15.247 (a) (2)	6 dB Bandwidth	Compliant	Section 5 Appendix C
§15.247 (b) (2)	Maximum Peak Output Power	Compliant	Section 4 Appendix A
§ 15.247 (c)	100 kHz Bandwidth of Frequency Band Edge	Compliant	Section 8 Appendix E
§15.247 (d)	Peak Power Spectral Density	Compliant	Section 7 Appendix D

4 - CONDUCTED OUTPUT POWER MEASUREMENT

4.1 Standard Applicable

According to §15.247(b) (1), for frequency hopping systems in the 2400-2483.5MHz band employing at least 75 hopping channels, and all direct sequence systems, the maximum peak output power of the transmitter shall not exceed 1 Watt.

4.2 Measurement Procedure

1. Place the EUT on the turntable and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.

4.3 Test Equipment

Manufacturer	Model No.	Serial No.	Calibration Due Date
Agilent	E4419B	GB40202891	4/8/03

4.4 Measurement Result

Frequency (MHz)	Output Power (dBm)	Output Power (dW)	Standard (W)	Result
2412	12.95	19.72	$\leq$ 1W	Compliant
2438	13.24	21.08	$\leq$ 1W	Compliant
2463	13.07	20.27	$\leq$ 1W	Compliant

5 – 6 DB BANDWIDTH

5.1 Standard Applicable

According to §15.247(a)(2), for direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

5.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

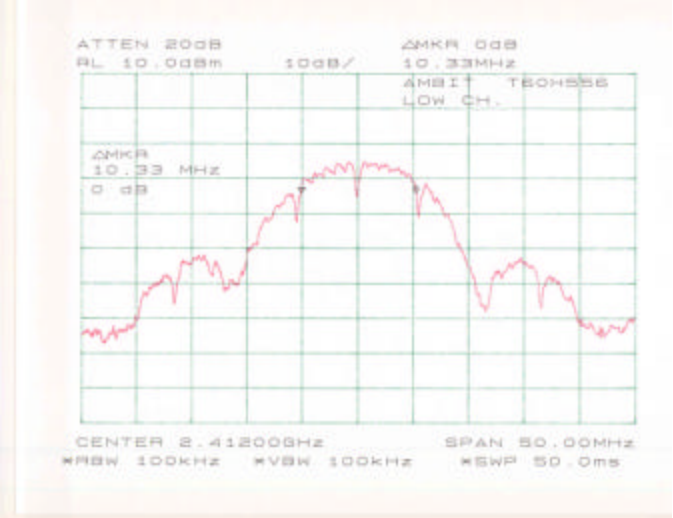
5.3 Measurement Result

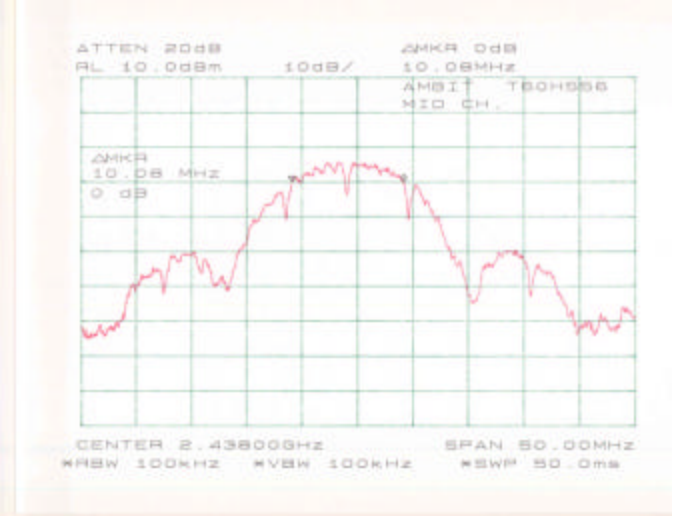
Please refer to appending plot for more information.

Frequency	Measured (MHz)	Standard (kHz)	Result
Low	9.17	≥ 500	Compliant
Mid	10.10	≥ 500	Compliant
High	10.83	≥ 500	Compliant

5.4 Plots of 6dB Bandwidth

Refer to Appendix D.


ATTEN 20dB
RL 10.0dBm
10dB/
ΔMKR 0dB
10.33MHz
AMBIT T60H556
LOW CH.
ΔMKR
10.33 MHz
0 dB
CENTER 2.412000GHz
SPAN 50.00MHz
*RBW 100kHz
*VBW 100kHz
*SWP 50.0ms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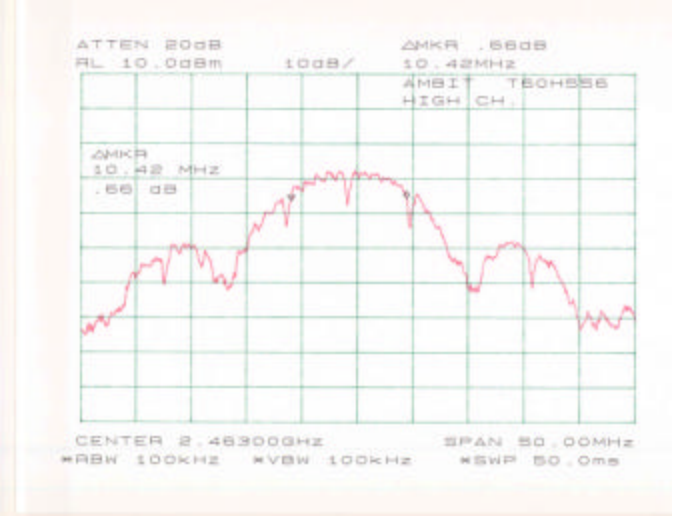
RL 10.0dBm
10dB/
ΔMKR 0dB
10.08MHz
AMBIT T60H556
MID CH.
ΔMKR
10.08 MHz
0 dB
CENTER 2.438000GHz
SPAN 50.00MHz
*RBW 100kHz
*VBW 100kHz
*SWP 50.0ms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RL 10.0dBm
10dB/
ΔMKR .66dB
10.42MHz
AMBIT T60H556
HIGH CH.
ΔMKR
10.42 MHz
.66 dB
CENTER 2.463000GHz
SPAN 50.00MHz
*RBW 100kHz
*VBW 100kHz
*SWP 50.0ms

6 - SPURIOUS EMISSION

6.1 Standard Applicable

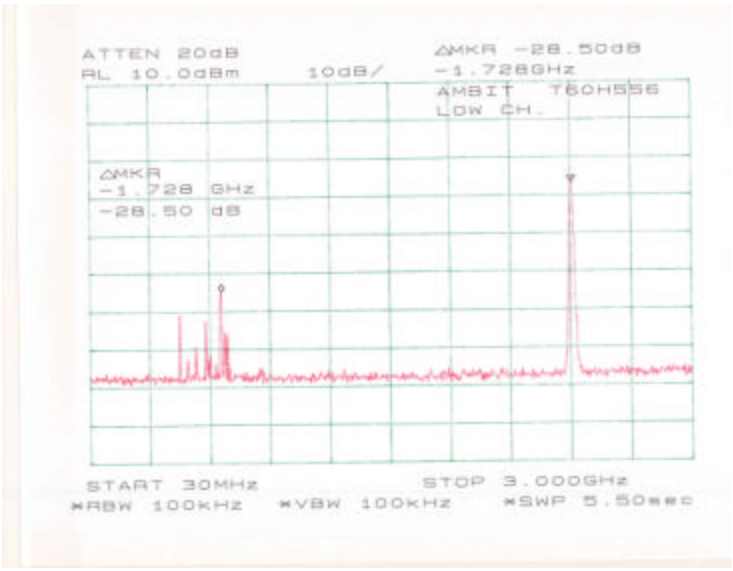
According to §15.209 (f) and §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation f a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit.

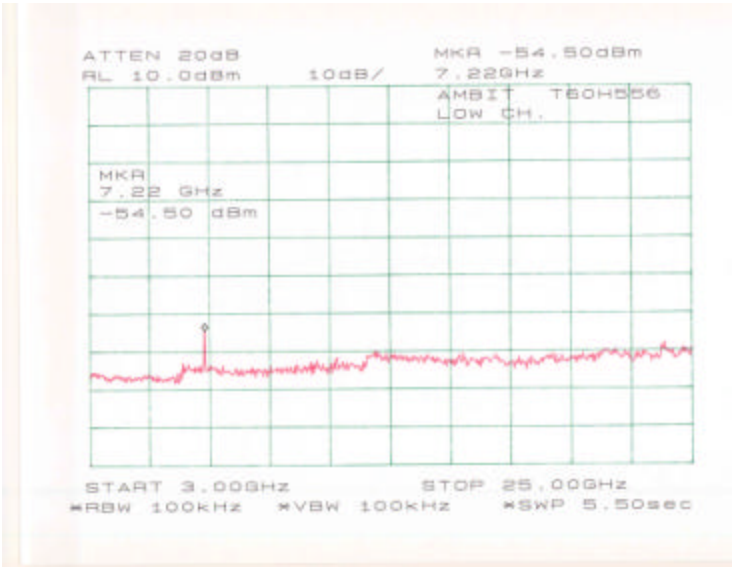
6.2 Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the SA on Max-Hold Mode, and then keep the EUT in transmitting mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

6.3 Measurement Result

The plots of spurious emission please refer to the following pages.


ATTEN 20dB
RL 10.0dBm
10dB/
ΔMKR -28.50dB
-1.728GHz
AMBIT T60H556
LOW CH.
ΔMKR
-1.728 GHz
-28.50 dB
START 30MHz
STOP 3.000GHz
#RBW 100kHz
#VBW 100kHz
#SWP 5.50sec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10dB/
MKR -54.50dBm
7.22GHz
AMBIT T60H556
LOW CH.
MKR
7.22 GHz
-54.50 dBm
START 3.00GHz
STOP 25.00GHz
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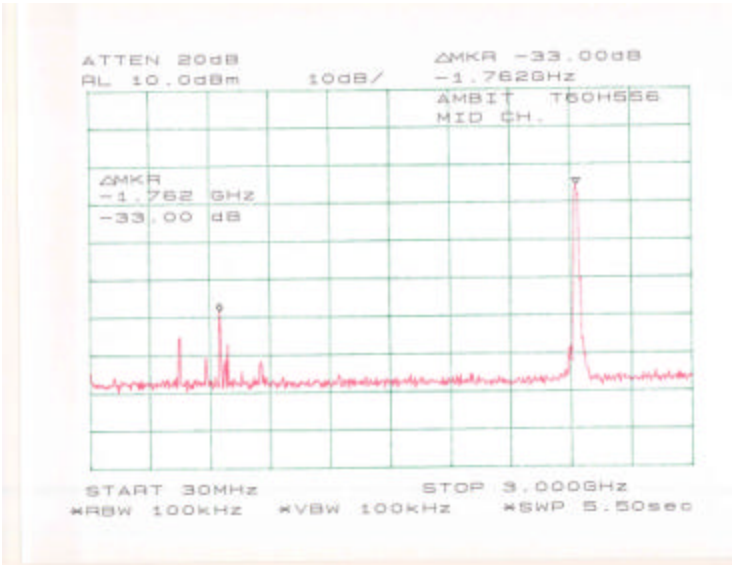
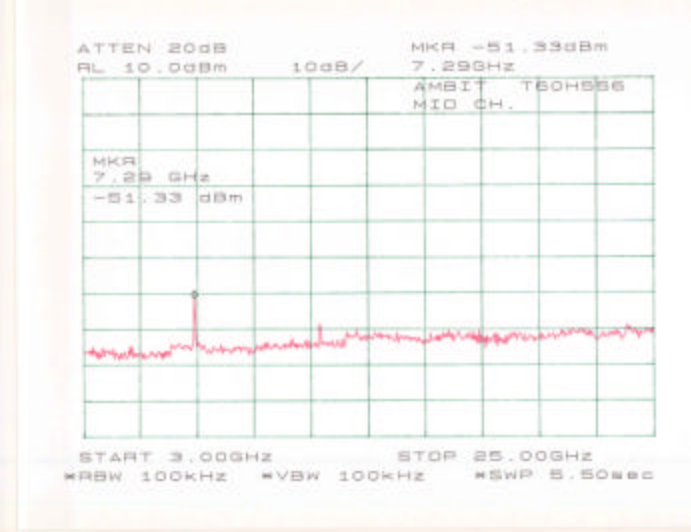
#VBW 100kHz
#SWP 5.50sec


ATTEN 20dB
RL 10.0dBm
10dB/
ΔMKR -33.00dB
-1.762GHz
AMBIT T60H556
MID CH.
ΔMKR
-1.762 GHz
-33.00 dB
START 30MHz
STOP 3.000GHz
#RBW 100kHz
#VBW 100kHz
#SWP 5.50sec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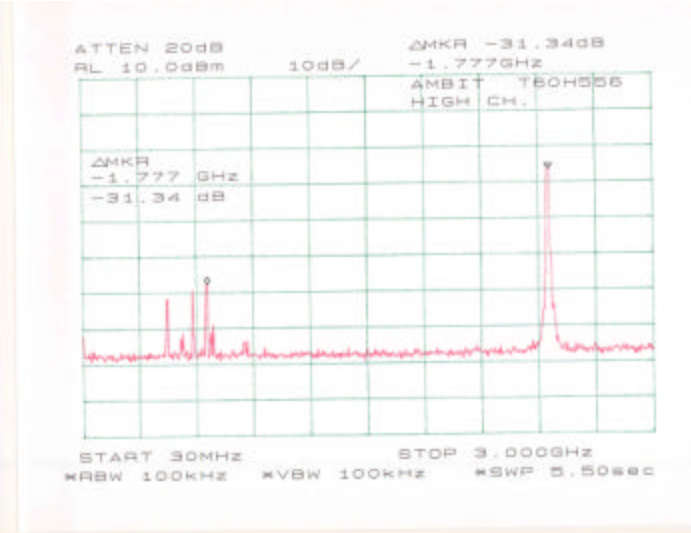
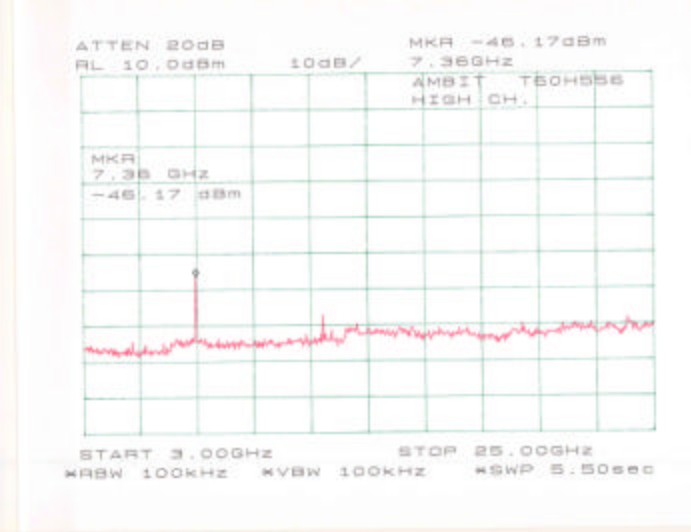
10dB/
MKR -51.33dBm
7.29GHz
AMBIT T60H556
MID CH.
MKR
7.29 GHz
-51.33 dBm
START 3.00GHz
STOP 25.00GHz
#RBW 100kHz
#VBW 100kHz
#SWP 5.50sec


ATTEN 20dB
RL 10.0dBm
10dB/
ΔMKR -31.34dB
-1.777GHz
AMBIT T60H556
HIGH CH.
ΔMKR
-1.777 GHz
-31.34 dB
START 30MHz
STOP 3.000GHz
#RBW 100kHz
#VBW 100kHz
#SWP 5.50sec


ATTEN 20dB
RL 10.0dBm
10dB/
MKR -46.17dBm
7.36GHz
AMBIT T60H556
HIGH CH.
MKR
7.36 GHz
-46.17 dBm
START 3.00GHz
STOP 25.00GHz
#RBW 100kHz
#VBW 100kHz
#SWP 5.50sec

7 - PEAK POWER SPECTRAL DENSITY

7.1 Standard Applicable

According to §15.247 (d), for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

7.2 Measurement Procedure

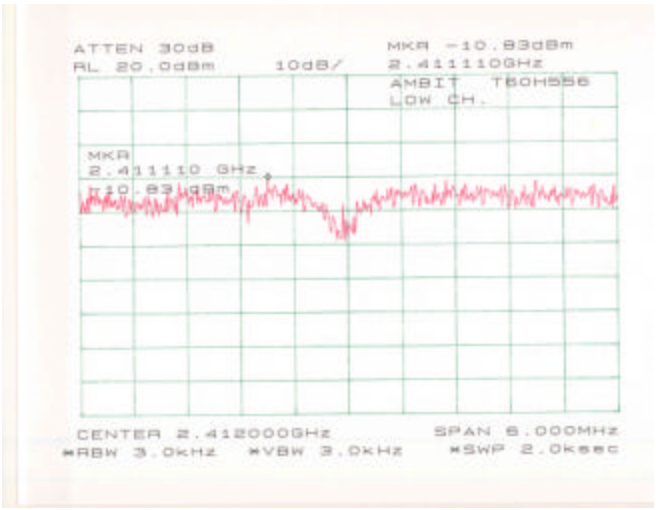
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 6MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Repeat above procedures until all frequencies measured were complete.

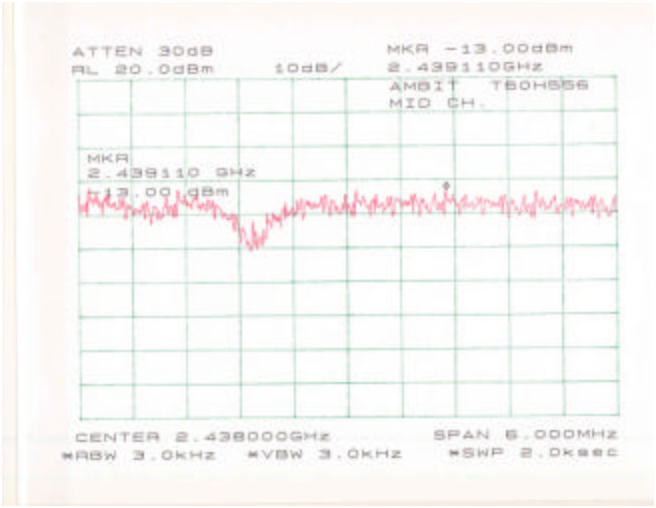
7.3 Measurement Results

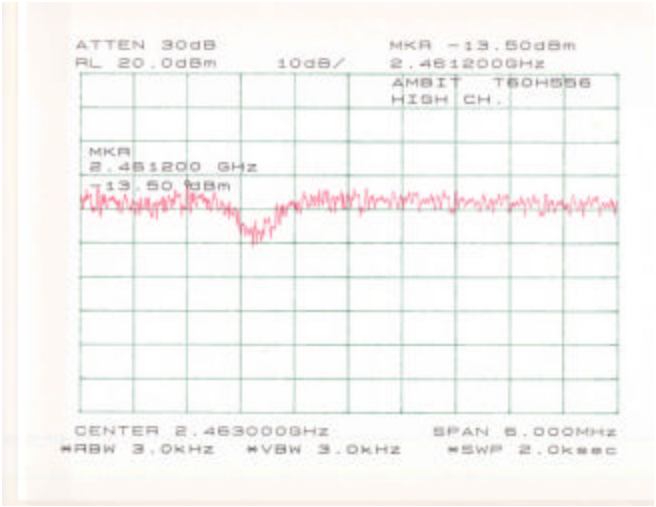
Frequency	Peak Power Spectral Density (dBm)	Standard (dBm)	Result
Low	-10.83	≤ 8	Compliant
Mid	-13.00	≤ 8	Compliant
High	-13.50	≤ 8	Compliant

6.4 Plot of Peak Power Spectral Density

Refer to the following page.


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -10.83dBm
2.411110GHz
AMBIT T60H556
LOW CH.
MKR
2.411110 GHz
-10.83 dBm
CENTER 2.412000GHz
SPAN 6.000MHz
#RBW 3.0kHz
#VBW 3.0kHz
#SWP 2.0ksec


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -13.00dBm
2.439110GHz
AMBIT T60H556
MID CH.
MKR
2.439110 GHz
-13.00 dBm
CENTER 2.438000GHz
SPAN 6.000MHz
#RBW 3.0kHz
#VBW 3.0kHz
#SWP 2.0ksec


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -13.50dBm
2.461200GHz
AMBIT T60H556
HIGH CH.
MKR
2.461200 GHz
-13.50 dBm
CENTER 2.463000GHz
SPAN 6.000MHz
#RBW 3.0kHz
#VBW 3.0kHz
#SWP 2.0ksec

8 - 100 KHZ BANDWIDTH OF BAND EDGES

8.1 Standard Applicable

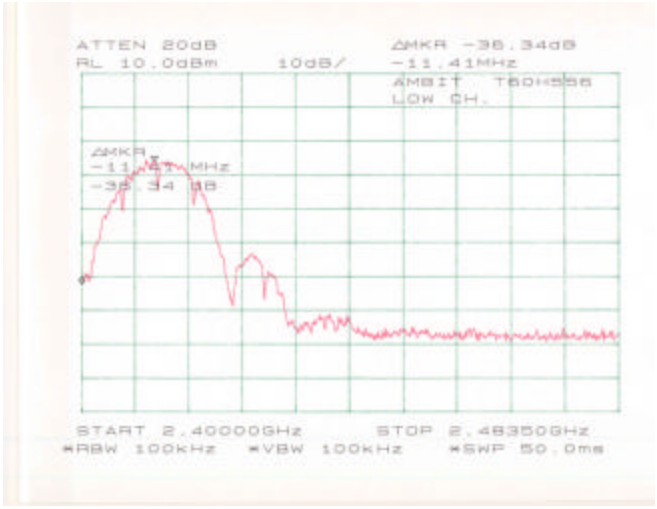
According to §15.247(c), in *any* 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. 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) see §15.205(c)).

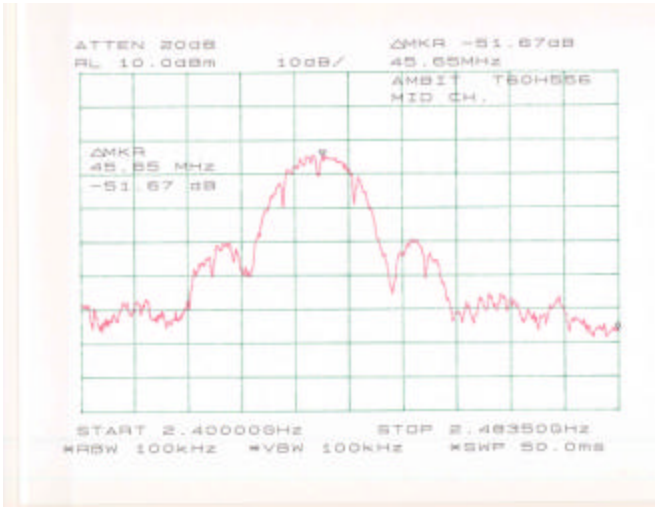
8.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

8.3 Measure Results

Please refer to Appendix E.


ATTEN 20dB
RL 10.0dBm
10dB/
ΔMKR -36.34dB
-11.41MHz
AMBIT T60H556
LOW CH.
ΔMKR
-11.41 MHz
-36.34 dB
START 2.400000GHz
STOP 2.483500GHz
#RBW 100kHz
#VBW 100kHz
#SWP 50.0ms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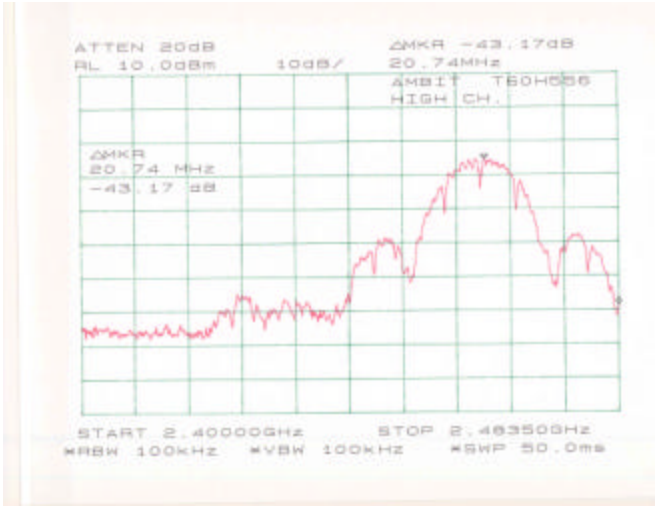
10dB/
ΔMKR -51.67dB
45.65MHz
AMBIT T60H556
MID CH.
ΔMKR
45.65 MHz
-51.67 dB
START 2.400000GHz
STOP 2.483500GHz
#RBW 100kHz
#VBW 100kHz
#SWP 50.0ms


ATTEN 20dB
RL 10.0dBm
10dB/
ΔMKR -43.17dB
20.74MHz
AMBIT T60H556
HIGH CH.
ΔMKR
20.74 MHz
-43.17 dB
START 2.400000GHz
STOP 2.483500GHz
#RBW 100kHz
#VBW 100kHz
#SWP 50.0ms

9 - ANTENNA REQUIREMENT

9.1 Standard Applicable

For intentional device, according to § 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.

And according to § 15.247 (1), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

9.2 Antenna Connected Construction

The directional gain of antenna used for transmitting is 1.72 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement.

Please refer to the Appendix F and the EUT photo for details.

10 - SPURIOUS RADIATED EMISSION

10.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is $\pm$4.0 dB.

10.2 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with the ANSI C63.4-2000. The specification used was the FCC 15 Subpart C limits.

The EUT was installed in the notebook. The notebook was put on the center back edge of the test table with the printer and modem on each side.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The host PC system was connected with 120Vac/60Hz power source.

10.3 Spectrum Analyzer Setup

According to FCC Rules, 47 CFR §15.33 (a) (1), the system was tested to 25GHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Start Frequency	30 MHz
Stop Frequency	25GHz
Sweep Speed	Auto
IF Bandwidth	1 MHz
Video Bandwidth	1 MHz
Quasi-Peak Adapter Bandwidth	120 kHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	1MHz

10.4 Test Procedure

For the radiated emissions test, the Host PC system power cord was connected to the AC floor outlet since the power supply used in the EUT did not provide an accessory power outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dBµV of specification limits), and are distinguished with a "**Qp**" in the data table.

10.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBµV means the emission is 7dBµV below the maximum limit for Subpart C. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Subpart C Limit

10.6 Summary of Test Results

According to the data in section 11.7, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.207 and 15.247, and had the worst margin of:

-6.9 dBµV (AVG.) at 7236.00 MHz in the Vertical polarization, Low Channel
-2.7 dBµV (AVG.) at 7314.00 MHz in the Vertical polarization, Middle Channel
-2.0 dBµV (AVG.) at 7389.00 MHz in the Vertical polarization, High Channel

10.7.1 Final test data, left film antenna

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart B	
Frequency	Ampl.	Comments	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m		Degree	Meter	H/ V	dBμV/m	DB	DB	dBμV/m	dBμV/m	dB
Low Channel											
2412	96.40	FUND	120	1.5	V	28.1	3.4	30.0	97.9	/	/
2412	93.7	FUND	180	1.5	H	28.1	3.4	30.0	95.2	/	/
7236.00	36.4	AVG	290	2.5	V	35.1	5.6	30.0	47.1	54	-6.9
7236.00	31.2	AVG	310	2.2	H	35.1	5.6	30.0	41.9	54	-12.1
4824.00	30.1	AVG	45	1.2	V	32.5	4.9	30.0	37.5	54	-16.5
4824.00	28.7	AVG	90	1.2	H	32.5	4.9	30.0	36.1	54	-17.9
7236.00	38.4	PEAK	290	2.0	V	35.1	5.6	30.0	49.1	74	-24.9
7236.00	33.7	PEAK	310	2.2	H	35.1	5.6	30.0	44.4	74	-29.6
4824.00	34.5	PEAK	60	1.2	V	32.5	4.9	30.0	41.9	74	-32.1
4824.00	32.6	PEAK	110	1.2	H	32.5	4.9	30.0	40.0	74	-34.0
Middle Channel											
2438.00	98.1	FUND	210	1.5	V	28.1	3.4	30.0	99.6	/	/
2438.00	96.1	FUND	270	2.0	H	28.1	3.4	30.0	97.6	/	/
7314.00	40.60	AVG	270	2.2	V	35.1	5.6	30.0	51.3	54	-2.7
7314.00	38.1	AVG	250	2.0	H	35.1	5.6	30.0	48.8	54	-5.2
4876.00	30.8	AVG	90	1.5	V	32.5	4.9	30.0	38.2	54	-15.8
4876.00	29.4	AVG	135	1.5	H	32.5	4.9	30.0	36.8	54	-17.2
7314.00	41.90	PEAK	210	2.0	V	35.1	5.6	30.0	52.6	74	-21.4
7314.00	40.6	PEAK	180	1.5	H	35.1	5.6	30.0	51.3	74	-22.7
4876.00	33.4	PEAK	90	1.5	V	32.5	4.9	30.0	40.8	74	-33.2
4876.00	32.7	PEAK	120	1.5	H	32.5	4.9	30.0	40.1	74	-33.9
High Channel											
2463.00	97.1	FUND	0	2.0	V	28.1	3.4	30.0	98.6	/	/
2463.00	96.8	FUND	270	2.0	H	28.1	3.4	30.0	98.3	/	/
7389.00	41.3	AVG	30	2.2	V	35.1	5.6	30.0	52.0	54	-2.0
7389.00	38.40	AVG	60	2.0	H	35.1	5.6	30.0	49.1	54	-4.9
4926.00	37.4	AVG	30	2.5	V	32.5	4.9	30.0	44.8	54	-9.2
4926.00	35.5	AVG	0	2.0	H	32.5	4.9	30.0	42.9	54	-11.1
7389.00	44.2	PEAK	0	1.8	V	35.1	5.6	30.0	54.9	74	-19.1
7389.00	40.70	PEAK	330	2.0	H	35.1	5.6	30.0	51.4	74	-22.6
4926.00	39.2	PEAK	45	2.2	V	32.5	4.9	30.0	46.6	74	-27.4
4926.00	37.6	PEAK	60	2.0	H	32.5	4.9	30.0	45.0	74	-29.0

Indicated			Table	Antenna		Correction Factor			Corrected Amplitude	FCC 15 Subpart B	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. DB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Unintentional Emission, 30MHz to 1000MHz											
117.49	45.3	/	320	1.0	V	11.9	1.8	25.0	34.0	43.5	-9.5
274.53	42.2	/	0	1.0	H	13.9	5.2	25.0	36.3	46	-9.7
177.63	41.2	/	160	1.2	V	13.4	3.9	25.0	33.5	43.5	-10.0
262.08	42.5	/	180	1.2	H	13.3	4.9	25.0	35.7	46	-10.3
320.15	42.9	/	60	1.2	H	15.5	2.8	26.0	35.2	46	-10.8
76.42	42.9	/	150	1.2	H	9.5	1.6	25.0	29.0	40	-11.0
210.55	40.1	/	120	1.5	H	12.5	4.7	25.0	32.3	43.5	-11.2
135.22	41.5	/	270	1.2	V	12.9	1.8	25.0	31.2	43.5	-12.3
88.75	41.6	/	0	1.8	V	9.7	2.2	25.0	28.5	43.5	-15.0

11 - CONDUCTED EMISSIONS

11.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is $\pm$2.4 dB.

11.2 EUT Setup

The measurement was performed at the **O**pen **A**rea **T**est **S**ite, using the same setup per ANSI C63.4-2000 measurement procedure. The specification used was FCC 15 Subpart C limits.

The EUT was installed in the notebook. The notebook was put on the center back edge of the test table.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The host PC system was connected with 120Vac/60Hz power source.

11.3 Spectrum Analyzer Setup

The spectrum analyzer was set with the following configurations during the conduction test:

Start Frequency	450 kHz
Stop Frequency	30 MHz
Sweep Speed	Auto
IF Bandwidth	10 kHz
Video Bandwidth	10 kHz
Quasi-Peak Adapter Bandwidth	9 kHz
Quasi-Peak Adapter Mode	Normal

11.4 Test Procedure

During the conducted emission test, the power cord of the host system was connected to the auxiliary outlet of the first LISN.

Maximizing procedure was performed on the six (6) highest emissions of each modes tested to ensure EUT is compliant with all installation combination.

All data was recorded in the peak detection mode. Quasi-peak readings were only performed when an emission was found to be marginal (within -4 dBµV of specification limits). Quasi-peak readings are distinguished with a "**Qp**".

11.5 Summary of Test Results

According to the data in section 12.6, the EUT complied with the FCC Conducted margin for a Class B device, with the *worst* margin reading of:

-1.8 dBμV at 0.690 MHz in the Neutral mode

11.6 Conducted Emissions Test Data

LINE CONDUCTED EMISSIONS				FCC PART 15 CLASS B	
Frequency MHz	Amplitude dBμV	Detector Qp/Ave/Peak	Phase Line/Neutral	Limit dBμV	Margin dB
0.690	46.2	QP	Neutral	48	-1.8
0.710	45.7	QP	Line	48	-2.3
3.010	38.8	QP	Line	48	-9.2
2.470	37.5	QP	Neutral	48	-10.5
20.450	31.5	QP	Line	48	-16.5
21.820	31.3	QP	Neutral	48	-16.7

11.7 Plot of Conducted Emissions Test Data

Plot(s) of Conducted Emissions Test Data is presented hereinafter as reference.