

FCC PART 15 SUBPART C
EMI MEASUREMENT AND TEST REPORT

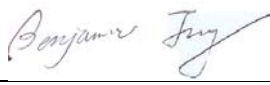

For

AeroComm, Inc.

13256 West 98th Street
Lenexa, Kansas
USA, 66215

FCC ID: KQL-PKLR2400-200

2003-10-23

| | |
|---|---|
| This Report Concerns: <input checked="" type="checkbox"/> Class II Permissive Change | Equipment Type: Frequency Hopping Spread Spectrum Transceiver Module |
| Test Engineer: Benjamin Jing /  | |
| Report No.: R0310092 | |
| Test Date: 2003-10-03 | |
| Reviewed By: Ling Zhang /  | |
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *AeroComm, Inc.* 's product, model no.: PKLR2400-200 or the "EUT" as referred to this report is a Frequency Hopping Spread Spectrum Transceiver Module for Mobile and Fixed Station which is measured approximately 4.8"L x 1.7"W x 0.8"H. The maximum output power of the EUT is 199.5mW, with the operating frequency range of 2402 – 2478 MHz.

The EUT was fed by APS AC adapter, M/N: D6-10.

** The test data gathered are from typical production samples provided by the manufacturer.*

1.2 Objective

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

This is a PCII application. The original application was granted on 10/26/2000. The difference between the original device and the current one is that the EUT was connected with two new antennas, MFB24012 and S151FL-L-RMM-2450S. Please see the Antenna Specification for the detailed information.

The objective of the manufacturer is to demonstrate compliance with FCC rules Conducted and Spurious Radiated Emission.

1.3 Related Submittal(s)/Grant(s)

The device was originally granted on 10/26/2000.

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2001, 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 BACL. 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 BACL 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 BACL 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 C63.4-2001.

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, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, CISPR 22: 1997: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods.

1.6 Test Equipment List

| Manufacturer | Description | Model | Serial Number | Cal. Due Date |
|--------------|----------------------------------|-------------|---------------|---------------|
| HP | Spectrum Analyzer | 8568B | 2517A01610 | 2003-10-30 |
| HP | Spectrum Analyzer | 8593A | 29190A00242 | 2004-05-01 |
| HP | Amplifier | 8447E | 1937A01054 | 2004-05-01 |
| HP | Quasi-Peak Adapter | 85650A | 2521A00718 | 2004-05-01 |
| Com-Power | Biconical Antenna | AB-100 | 14012 | 2004-05-01 |
| Com-Power | Log Periodic Antenna | AL-100 | 16091 | 2004-05-01 |
| Com-Power | Log Periodic Antenna | AB-900 | 15049 | 2004-05-01 |
| Agilent | Spectrum Analyzer (9KHz – 40GHz) | 8564E | 08303 | 2004-08-01 |
| Agilent | Spectrum Analyzer (9KHz – 50GHz) | 8565EC | 06042 | 2004-05-03 |
| HP | Amplifier (1-26.5GHz) | 8449B | 3147A00400 | 2004-03-14 |
| A.H.System | Horn Antenna (700MHz-18GHz) | SAS-200/571 | 261 | 2004-05-31 |

*** Statement of Traceability:** Bay Area Compliance Laboratory Corp. certifies that all calibration has been performed using suitable standards traceable to the NIST.

1.7 Local Support Equipment List and Details

| Manufacturer | Description | Model | Serial Number | FCC ID |
|--------------|-------------|-------|---------------|--------|
| Sony | Notebook | GR370 | N/A | DOC |
| HP | Printer | 2225C | N/A | DOC |

1.8 External I/O Cabling List and Details

| Cable Description | Length (M) | Port/From | To |
|-------------------|------------|-----------------|---------------|
| Shielded Cable | 1.0 | Printer Port/PC | Printer |
| Shielded Cable | 1.0 | RS232 Port/PC | RS232 Port/PC |

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 various system components in a manner similar to a typical use. The test software provided by the customer, is started the Windows XP terminal program under the Windows XP operating system.

2.3 Special Accessories

As shown in section 2.7, all interface cables used for compliance testing are shielded as normally supplied by their respective support equipment manufacturers.

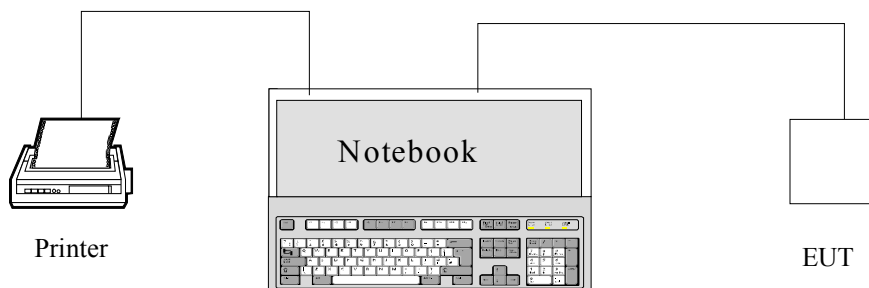
2.4 Schematics / Block Diagram

Please refer to Exhibit D.

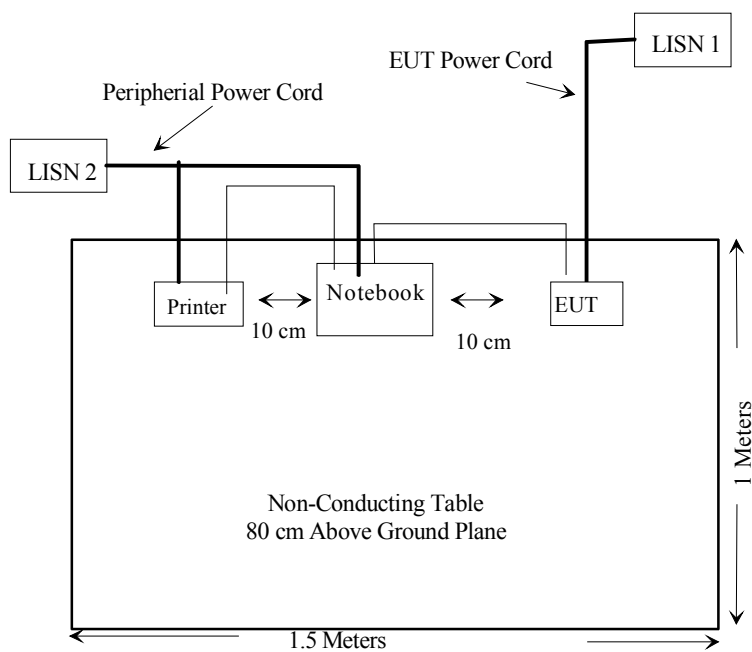
2.5 Equipment Modifications

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 |
|-------------|------------------------|-----------|-----------|
| § 2.1093 | RF Safety Requirements | Compliant | Section 7 |
| §15.203 | Antenna Requirement | Compliant | Section 6 |
| §15.207 (a) | Conducted Emission | Compliant | Section 5 |
| §15.209 | Radiated Emission | Compliant | Section 4 |

4 - RADIATED EMISSION

4.1 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 ± 4.0 dB.

4.2 Test Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with the ANSI C63.4-2001. The specification used was the FCC 15 Subpart C limits.

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 EUT was connected with 120Vac/60Hz power source.

4.3 Spectrum Analyzer Setup

According to FCC Rules, 47 CFR §15.33 (a) (1), the system was tested to 10000 MHz.

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

| | |
|------------------------------------|-----------|
| Start Frequency | 30 MHz |
| Stop Frequency | 10000 MHz |
| 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 |

4.4 Test Procedure

For the radiated emissions test, both the laptop and all peripheral power cords were connected to the AC floor outlet since the power supply used in the laptop 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 dB μ V of specification limits), and are distinguished with a "Qp" in the data table.

4.5 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

4.6 Test Equipment

| Manufacturer | Model No. | Description | Calibration Due Date |
|--------------|-----------|-------------------|----------------------|
| Agilent | 8564E | Spectrum Analyzer | 2004-08-01 |

4.7 Summary of Test Results

According to the data in section 4.8, 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:

EUT with SI51FL-L-RMM-2450S Antenna, Standard 5" Cable

-9.5 dB at 7204.50 MHz in the Vertical polarization, Low Channel.

-9.3 dB at 7327.20 MHz in the Vertical polarization, Middle Channel.

-9.6dB at 7434.84 MHz in the Vertical polarization, High Channel.

-10.7 dB at 240.67 MHz in the Vertical polarization, Unintentional Emission

EUT with MFB24012Antenna, Longest 1280" Cable

-8.1 dB at 7204.50 MHz in the Vertical polarization, Low Channel.

-8.2 dB at 7327.20 MHz in the Vertical polarization, Middle Channel.

-8.5dB at 7434.84 MHz in the Vertical polarization, High Channel.

-10.5 dB at 240.67 MHz in the Vertical polarization, Unintentional Emission

4.8 Radiated Emission Test Data**4.8.1 EUT with S151FL-L-RMM-2450S Antenna, 30MHz ~ 10 GHz, 3 Meters, Standard 5" Cable**

| Indicated | | | Table | Antenna | | Correction Factor | | | FCC 15 Subpart C | | |
|----------------|--------|-----------|--------|---------|---------|-------------------|------|-------------|------------------|--------|-----------|
| Frequency | Ampl. | Direction | Height | Polar | Antenna | Cable Loss | Amp. | Corr. Ampl. | Limit | Margin | Mode |
| MHz | dBμV/m | Degree | Meter | H/V | dBμV/m | dBμV/m | dB | dBμV/m | dBμV/m | dB | |
| Low Channel | | | | | | | | | | | |
| 2401.50 | 123.2 | 30 | 1.6 | v | 28.1 | 3.4 | 35.2 | 119.5 | | | Fund/Peak |
| 2401.50 | 110.3 | 90 | 1.5 | h | 28.1 | 3.4 | 35.2 | 106.6 | | | Fund/Peak |
| 2401.50 | 122.6 | 30 | 1.6 | v | 28.1 | 3.4 | 35.2 | 118.9 | | | Fund/Ave |
| 2401.50 | 109.9 | 90 | 1.5 | h | 28.1 | 3.4 | 35.2 | 106.2 | | | Fund/Ave |
| 7204.50 | 37.3 | 180 | 1.6 | v | 35.1 | 5.6 | 33.5 | 44.5 | 54 | -9.5 | Ave |
| 7204.50 | 36.1 | 90 | 1.5 | h | 35.1 | 5.6 | 33.5 | 43.3 | 54 | -10.7 | Ave |
| 4803.00 | 35.1 | 30 | 1.6 | v | 32.5 | 4.9 | 33.0 | 39.5 | 54 | -14.5 | Ave |
| 4803.00 | 33.2 | 0 | 1.8 | h | 32.5 | 4.9 | 33.0 | 37.6 | 54 | -16.4 | Ave |
| 7204.50 | 46.5 | 180 | 1.6 | v | 35.1 | 5.6 | 33.5 | 53.7 | 74 | -20.3 | Peak |
| 7204.50 | 46.2 | 90 | 1.5 | h | 35.1 | 5.6 | 33.5 | 53.4 | 74 | -20.6 | Peak |
| 4803.00 | 45.4 | 30 | 1.6 | v | 32.5 | 4.9 | 33.0 | 49.8 | 74 | -24.2 | Peak |
| 4803.00 | 43.5 | 0 | 1.8 | h | 32.5 | 4.9 | 33.0 | 47.9 | 74 | -26.1 | Peak |
| Middle Channel | | | | | | | | | | | |
| 2442.40 | 124.5 | 0 | 1.5 | v | 28.1 | 3.4 | 35.2 | 120.8 | | | Fund/Peak |
| 2442.40 | 110.9 | 160 | 1.5 | h | 28.1 | 3.4 | 35.2 | 107.2 | | | Fund/Peak |
| 2442.40 | 123.9 | 0 | 1.5 | v | 28.1 | 3.4 | 35.2 | 120.2 | | | Fund/Ave |
| 2442.40 | 108.3 | 160 | 1.5 | h | 28.1 | 3.4 | 35.2 | 104.6 | | | Fund/Ave |
| 7327.20 | 37.5 | 290 | 1.6 | v | 35.1 | 5.6 | 33.5 | 44.7 | 54 | -9.3 | Ave |
| 7327.20 | 36.3 | 330 | 1.5 | h | 35.1 | 5.6 | 33.5 | 43.5 | 54 | -10.5 | Ave |
| 4884.80 | 35.2 | 330 | 1.2 | v | 32.5 | 4.9 | 33.0 | 39.6 | 54 | -14.4 | Ave |
| 4884.80 | 33.3 | 310 | 1.4 | h | 32.5 | 4.9 | 33.0 | 37.7 | 54 | -16.3 | Ave |
| 7327.20 | 46.7 | 290 | 1.6 | v | 35.1 | 5.6 | 33.5 | 53.9 | 74 | -20.1 | Peak |
| 7327.20 | 46.3 | 330 | 1.5 | h | 35.1 | 5.6 | 33.5 | 53.5 | 74 | -20.5 | Peak |
| 4884.80 | 45.6 | 330 | 1.2 | v | 32.5 | 4.9 | 33.0 | 50.0 | 74 | -24.0 | Peak |
| 4884.80 | 43.8 | 310 | 1.4 | h | 32.5 | 4.9 | 33.0 | 48.2 | 74 | -25.8 | Peak |
| High Channel | | | | | | | | | | | |
| 2478.28 | 122.8 | 90 | 1.5 | v | 28.1 | 3.4 | 35.2 | 119.1 | | | Fund/Peak |
| 2478.28 | 107.8 | 60 | 1.5 | h | 28.1 | 3.4 | 35.2 | 104.1 | | | Fund/Peak |
| 2478.28 | 122.3 | 90 | 1.5 | v | 28.1 | 3.4 | 35.2 | 118.6 | | | Fund/Ave |
| 2478.28 | 106.9 | 60 | 1.5 | h | 28.1 | 3.4 | 35.2 | 103.2 | | | Fund/Ave |
| 7434.84 | 37.2 | 90 | 1.4 | v | 35.1 | 5.6 | 33.5 | 44.4 | 54 | -9.6 | Ave |
| 7434.84 | 35.9 | 270 | 1.5 | h | 35.1 | 5.6 | 33.5 | 43.1 | 54 | -10.9 | Ave |
| 4956.56 | 35.1 | 30 | 1.8 | v | 32.5 | 4.9 | 33.0 | 39.5 | 54 | -14.5 | Ave |
| 4956.56 | 32.9 | 250 | 1.4 | h | 32.5 | 4.9 | 33.0 | 37.3 | 54 | -16.7 | Ave |
| 7434.84 | 46.4 | 90 | 1.4 | v | 35.1 | 5.6 | 33.5 | 53.6 | 74 | -20.4 | Peak |
| 7434.84 | 46.1 | 270 | 1.5 | h | 35.1 | 5.6 | 33.5 | 53.3 | 74 | -20.7 | Peak |
| 4956.56 | 45.3 | 30 | 1.8 | v | 32.5 | 4.9 | 33.0 | 49.7 | 74 | -24.3 | Peak |
| 4956.56 | 43.4 | 250 | 1.4 | h | 32.5 | 4.9 | 33.0 | 47.8 | 74 | -26.2 | Peak |

Unintentional Emission

| Frequency MHz | Indicated | | Table Height Meter | Antenna | | Correction Factor | | | FCC 15 Subpart B | |
|------------------|-----------------------|---------------------|--------------------------|--------------|-------------------------|-------------------------------|------------|--------------------------------|-----------------------|--------------|
| | Ampl. dB μ V/m | Direction Degree | | Polar H/V | Antenna dB μ V/m | Cable Loss dB μ V/m | Amp. dB | Corr. Ampl. dB μ V/m | Limit dB μ V/m | Margin dB |
| 240.67 | 44.3 | 270 | 1.5 | v | 13.8 | 2.2 | 25.0 | 35.3 | 46 | -10.7 |
| 306.07 | 41.5 | 270 | 1.4 | v | 14.4 | 2.3 | 25.0 | 33.2 | 46 | -12.8 |
| 110.26 | 39.8 | 60 | 1.2 | v | 11.3 | 1.5 | 25.0 | 27.6 | 43.5 | -15.9 |
| 72.07 | 38.5 | 270 | 1.4 | h | 9.2 | 1.2 | 25.0 | 23.9 | 40 | -16.1 |
| 62.80 | 37.2 | 120 | 1.5 | h | 9.4 | 1.3 | 25.0 | 22.9 | 40 | -17.1 |
| 254.07 | 36.9 | 130 | 1.6 | v | 13.3 | 2.2 | 25.0 | 27.4 | 46 | -18.6 |

4.8.2 EUT with MFB24012 Antenna, 30MHz ~ 10 GHz, 3 Meters, the longest 1280" cable

| Indicated | | | Table | Antenna | | Correction Factor | | | FCC 15 Subpart C | | |
|----------------|--------|-----------|--------|---------|---------|-------------------|------|-------------|------------------|--------|-----------|
| Frequency | Ampl. | Direction | Height | Polar | Antenna | Cable Loss | Amp. | Corr. Ampl. | Limit | Margin | Mode |
| MHz | dBμV/m | Degree | Meter | H/V | dBμV/m | dBμV/m | dB | dBμV/m | dBμV/m | dB | |
| Low Channel | | | | | | | | | | | |
| 2401.50 | 119.7 | 0 | 1.8 | v | 28.1 | 3.4 | 35.2 | 116.0 | | | Fund/Peak |
| 2401.50 | 108.8 | 0 | 1.5 | h | 28.1 | 3.4 | 35.2 | 105.1 | | | Fund/Peak |
| 2401.50 | 118.8 | 0 | 1.8 | v | 28.1 | 3.4 | 35.2 | 115.1 | | | Fund/Ave |
| 2401.50 | 107.9 | 0 | 1.5 | h | 28.1 | 3.4 | 35.2 | 104.2 | | | Fund/Ave |
| 7204.50 | 38.7 | 180 | 1.6 | v | 35.1 | 5.6 | 33.5 | 45.9 | 54 | -8.1 | Ave |
| 7204.50 | 37.6 | 90 | 2.0 | h | 35.1 | 5.6 | 33.5 | 44.8 | 54 | -9.2 | Ave |
| 4803.00 | 34.3 | 30 | 1.6 | v | 32.5 | 4.9 | 33.0 | 38.7 | 54 | -15.3 | Ave |
| 4803.00 | 33.5 | 0 | 1.8 | h | 32.5 | 4.9 | 33.0 | 37.9 | 54 | -16.1 | Ave |
| 7204.50 | 48.4 | 180 | 1.6 | v | 35.1 | 5.6 | 33.5 | 55.6 | 74 | -18.4 | Peak |
| 7204.50 | 47.6 | 90 | 2.0 | h | 35.1 | 5.6 | 33.5 | 54.8 | 74 | -19.2 | Peak |
| 4803.00 | 44.1 | 30 | 1.6 | v | 32.5 | 4.9 | 33.0 | 48.5 | 74 | -25.5 | Peak |
| 4803.00 | 43.7 | 0 | 1.8 | h | 32.5 | 4.9 | 33.0 | 48.1 | 74 | -25.9 | Peak |
| Middle Channel | | | | | | | | | | | |
| 2442.40 | 121.5 | 30 | 1.8 | v | 28.1 | 3.4 | 35.2 | 117.8 | | | Fund/Peak |
| 2442.40 | 108.6 | 330 | 1.5 | h | 28.1 | 3.4 | 35.2 | 104.9 | | | Fund/Peak |
| 2442.40 | 120.4 | 30 | 1.8 | v | 28.1 | 3.4 | 35.2 | 116.7 | | | Fund/Ave |
| 2442.40 | 107.5 | 330 | 1.5 | h | 28.1 | 3.4 | 35.2 | 103.8 | | | Fund/Ave |
| 7327.20 | 38.6 | 0 | 1.2 | v | 35.1 | 5.6 | 33.5 | 45.8 | 54 | -8.2 | Ave |
| 7327.20 | 37.4 | 30 | 1.5 | h | 35.1 | 5.6 | 33.5 | 44.6 | 54 | -9.4 | Ave |
| 4884.80 | 34.5 | 90 | 1.2 | v | 32.5 | 4.9 | 33.0 | 38.9 | 54 | -15.1 | Ave |
| 4884.80 | 33.6 | 0 | 1.5 | h | 32.5 | 4.9 | 33.0 | 38.0 | 54 | -16.0 | Ave |
| 7327.20 | 48.3 | 0 | 1.2 | v | 35.1 | 5.6 | 33.5 | 55.5 | 74 | -18.5 | Peak |
| 7327.20 | 47.2 | 30 | 1.5 | h | 35.1 | 5.6 | 33.5 | 54.4 | 74 | -19.6 | Peak |
| 4884.80 | 44.3 | 90 | 1.2 | v | 32.5 | 4.9 | 33.0 | 48.7 | 74 | -25.3 | Peak |
| 4884.80 | 43.7 | 0 | 1.5 | h | 32.5 | 4.9 | 33.0 | 48.1 | 74 | -25.9 | Peak |
| High Channel | | | | | | | | | | | |
| 2478.28 | 119.1 | 180 | 1.8 | v | 28.1 | 3.4 | 35.2 | 115.4 | | | Fund/Peak |
| 2478.28 | 109.3 | 330 | 1.5 | h | 28.1 | 3.4 | 35.2 | 105.6 | | | Fund/Peak |
| 2478.28 | 118.2 | 180 | 1.8 | v | 28.1 | 3.4 | 35.2 | 114.5 | | | Fund/Ave |
| 2478.28 | 108.4 | 330 | 1.5 | h | 28.1 | 3.4 | 35.2 | 104.7 | | | Fund/Ave |
| 7434.84 | 38.3 | 90 | 1.4 | v | 35.1 | 5.6 | 33.5 | 45.5 | 54 | -8.5 | Ave |
| 7434.84 | 37.5 | 270 | 1.5 | h | 35.1 | 5.6 | 33.5 | 44.7 | 54 | -9.3 | Ave |
| 4956.56 | 33.8 | 30 | 1.8 | v | 32.5 | 4.9 | 33.0 | 38.2 | 54 | -15.8 | Ave |
| 4956.56 | 33.2 | 250 | 1.4 | h | 32.5 | 4.9 | 33.0 | 37.6 | 54 | -16.4 | Ave |
| 7434.84 | 47.9 | 90 | 1.4 | v | 35.1 | 5.6 | 33.5 | 55.1 | 74 | -18.9 | Peak |
| 7434.84 | 47.4 | 270 | 1.5 | h | 35.1 | 5.6 | 33.5 | 54.6 | 74 | -19.4 | Peak |
| 4956.56 | 43.7 | 30 | 1.8 | v | 32.5 | 4.9 | 33.0 | 48.1 | 74 | -25.9 | Peak |
| 4956.56 | 43.5 | 250 | 1.4 | h | 32.5 | 4.9 | 33.0 | 47.9 | 74 | -26.1 | Peak |

Unintentional Emission

| Frequency MHz | Indicated | | Table Height Meter | Antenna | | Correction Factor | | | FCC 15 Subpart B | |
|------------------|-----------------------|---------------------|--------------------------|--------------|-------------------------|-------------------------------|------------|--------------------------------|-----------------------|--------------|
| | Ampl. dB μ V/m | Direction Degree | | Polar H/V | Antenna dB μ V/m | Cable Loss dB μ V/m | Amp. dB | Corr. Ampl. dB μ V/m | Limit dB μ V/m | Margin dB |
| 240.67 | 44.5 | 270 | 1.5 | v | 13.8 | 2.2 | 25.0 | 35.5 | 46 | -10.5 |
| 306.07 | 42.2 | 270 | 1.4 | v | 14.4 | 2.3 | 25.0 | 33.9 | 46 | -12.1 |
| 72.07 | 39.2 | 270 | 1.4 | h | 9.2 | 1.2 | 25.0 | 24.6 | 40 | -15.4 |
| 110.26 | 39.8 | 60 | 1.2 | v | 11.3 | 1.5 | 25.0 | 27.6 | 43.5 | -15.9 |
| 62.80 | 37.6 | 120 | 1.5 | h | 9.4 | 1.3 | 25.0 | 23.3 | 40 | -16.7 |
| 254.07 | 37.6 | 130 | 1.6 | v | 13.3 | 2.2 | 25.0 | 28.1 | 46 | -17.9 |

5 - CONDUCTED EMISSION

5.1 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 ± 2.4 dB.

5.2 Test Setup

The measurement was performed at shield room, using the same setup per ANSI C63.4 – 2001 measurement procedure. The specification used was FCC Class B limits.

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

The EUT was connected with 120Vac/60Hz power source.

5.3 Spectrum Analyzer Setup

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

| | |
|------------------------------------|---------|
| Start Frequency | 150 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 |

5.4 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 dB μ V of specification limits). Quasi-peak readings are distinguished with a "Qp".

5.5 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:

-12.6 dB μ V at 0.150 MHz in the Neutral mode

5.6 Conducted Emissions Test Data

| LINE CONDUCTED EMISSIONS | | | | FCC CLASS B | |
|--------------------------|-------------------------|-------------------------|-----------------------|---------------------|--------------|
| Frequency MHz | Amplitude dB μ V | Detector Qp/Ave/Peak | Phase Line/Neutral | Limit dB μ V | Margin dB |
| 0.150 | 53.4 | QP | Neutral | 66 | -12.6 |
| 0.150 | 53.1 | QP | Line | 66 | -12.9 |
| 1.120 | 22.8 | AVG | Line | 46 | -23.2 |
| 9.060 | 26.7 | AVG | Line | 50 | -23.3 |
| 1.100 | 22.5 | AVG | Neutral | 46 | -23.5 |
| 1.120 | 28.9 | QP | Line | 56 | -27.1 |
| 9.060 | 32.2 | QP | Line | 60 | -27.8 |
| 1.100 | 26.5 | QP | Neutral | 56 | -29.5 |
| 0.150 | 25.6 | AVG | Neutral | 56 | -30.4 |
| 0.150 | 24.3 | AVG | Line | 56 | -31.7 |
| 17.300 | 14.3 | QP | Neutral | 60 | -45.7 |
| 17.300 | 0.8 | AVG | Neutral | 50 | -49.2 |

5.7 Plot of Conducted Emissions Test Data

Plot(s) of Conducted Emissions Test Data is presented in the following page as reference.

Bay Area Compliance Laboratory Corp
FCC 15B

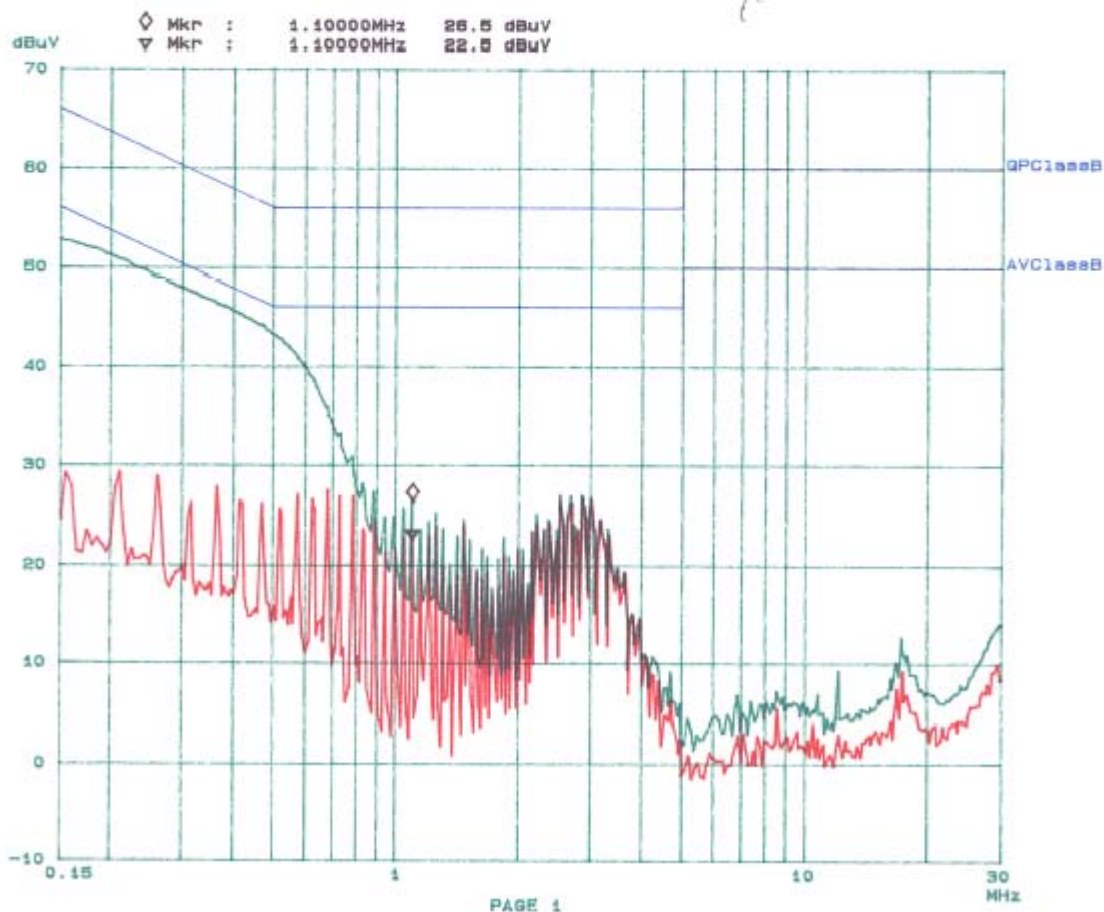
17. Oct 03 12:11

EUT: PKLR2400-200
Manuf: Aerocomm
Op Cond: Normal
Operator: Benjamin
Comment: N

Scan Settings (3 Ranges)

| Start | Stop | Step | IF BW | Detector | M-Time | Atten | Preamp |
|-------|------|------|-------|----------|--------|---------|--------|
| 150k | 1M | 5k | 9k | QP+AV | 20ms | 10dB LN | OFF |
| 1M | 5M | 10k | 9k | QP+AV | 1ms | 10dB LN | OFF |
| 5M | 30M | 100k | 9k | QP+AV | 1ms | 10dB LN | OFF |

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 6dB



Bay Area Compliance Laboratory Corp
FCC 15B

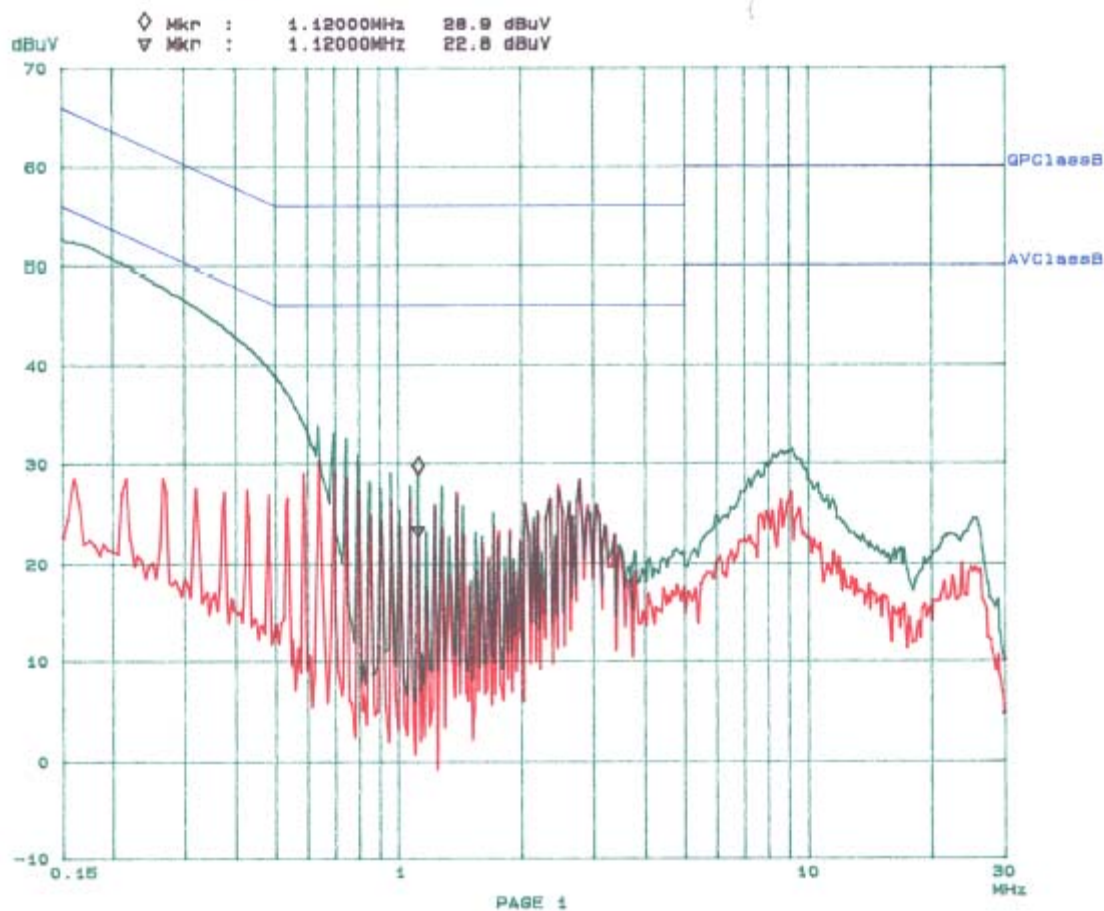
17. Oct 03 09:25

EUT: PKLR2400-200
Manuf: Aerocomm
Op Cond: Normal
Operator: Benjamin
Comment: L

Scan Settings (3 Ranges)

| Start | Stop | Step | IF BW | Detector | M-Time | Atten | Preamp |
|-------|------|------|-------|----------|--------|---------|--------|
| 150k | 1M | 5k | 9k | QP+AV | 20ms | 10dB LN | OFF |
| 1M | 5M | 10k | 9k | QP+AV | 1ms | 10dB LN | OFF |
| 5M | 30M | 100k | 9k | QP+AV | 1ms | 10dB LN | OFF |

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 5dB



6 - ANTENNA REQUIREMENT

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.

The gain of antenna used for transmitting is 12 dBi for MFB24012, and 5.0 dBi for S151FL-L-RMM-2450S Antenna. The antenna connectors are designed with unique connector and therefore comply with 15.203. Please see EUT photo for details.