# FCC PART 15.247

# EMI MEASUREMENT AND TEST REPORT

For

## Lionda Technology Company Limited

Block 2 Laodong 2nd Industrial Area, Xixian, Baoan,
Shenzhen, Guangdong, China 518102

**FCC ID: O63PM3375DLD04**

2004-03-17

| **This Report Concerns:** | **Equipment Type:** |
|---|---|
| ☒ Original Report | 2.4GHz 77-Channel Digital Spread-Spectrum Cordless Telephone, DTS, Transceiver |

| | |
|---|---|
| **Test Engineer:** | Ming Jing / |
| **Report No.:** | R0403052 |
| **Test Date:** | 2004-03-08 |
| **Reviewed By:** | Ling Zhang / |
| **Prepared By:** | Bay Area Compliance Laboratory Corporation (BACL)<br>230 Commercial Street<br>Sunnyvale, CA 94085<br>Tel: (408) 732-9162<br>Fax: (408) 732 9164 |

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# GENERAL INFORMATION

**Product Description for Equipment Under Test (EUT)**

The *Lionda Technology Company Limited's*, model: *PM3375/PM3305,* or the "EUT" as referred to in this report is a 2.4GHz 77-Channel Digital Spread-Spectrum Cordless Telephone with Caller ID and Call Waiting on Handset plus answering machine system and speakerphone on base unit, Transceiver. The EUT was composed of two parts, one is the base which measures approximately 6.8" L x 6.8"W x 2.5" H, and the other is the handset which measures 2.25"L x 1.25" W x 5.5" H. The EUT is a DTS device, which operates at the frequency range of 2402.304 – 2480.128 MHz, with the maximum conducted output power of 10.50dBm (11.22mW) for base unit and 10.17dBm (10.39mW) for handset unit.

The base unit of EUT utilized the Lionda power adapter, M/N: U090050D.

** The test data gathered are from a production sample, S/N: 337501, provided by the manufacturer.*

**Objective**

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

The objective is to determine compliance with FCC rules for Output Power, Antenna Requirements, 6 dB Bandwidth, power spectral density, 100 kHz Bandwidth of Band Edges Measurement, Out of Band Emission, Spurious Emission, Conducted and Spurious Radiated Emission.

**Related Submittal(s)/Grant(s)**

No Related Submittals.

**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 Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

**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 – Digital Devices, CISPER 22: 1997: Electromagnetic Interference – Limits and Methods of Measurement of Information Technology Equipment test methods.

# SYSTEM TEST CONFIGURATION

**Justification**

The EUT was configured for testing according to ANSI C63.4-2001.

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

**EUT Exercise Software**

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components.

Once loaded, set the Tx channel to low, mid and high for testing.

**Special Accessories**

As shown in following test block diagram, all interface cables used for compliance testing are shielded.

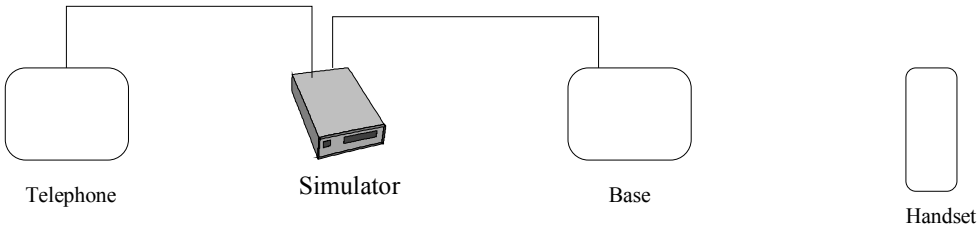
**Schematics / Block Diagram**

Please refer to Appendix A.

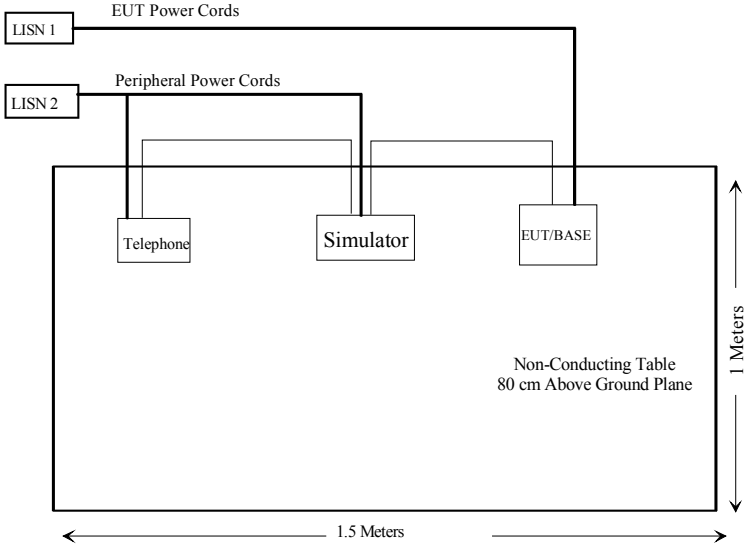
**Equipment Modifications**

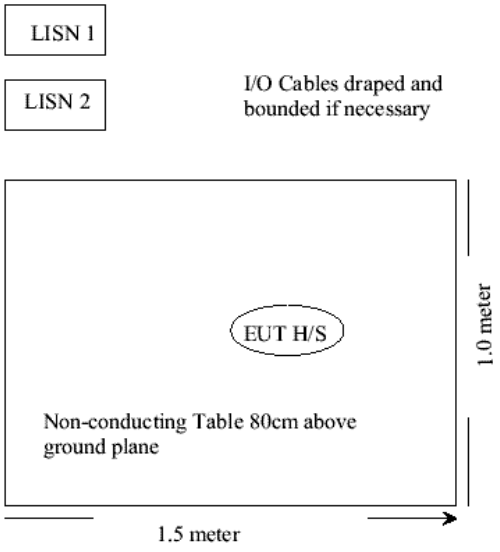
No modifications were made to the EUT.

## Configuration of Test System




## Test Setup Block Diagram



**Local Support Equipment List and Details**

| Manufacturer | Description | Model | Serial Number | FCC ID |
|---|---|---|---|---|
| TELTONE CORP. | SIMULATOR | TLS-3B-01 | 80071 | DOC |
| PANASONIC | Telephone | KX-T3175 | 6IBTB142741 | ACJMLA-75986-MT-E |

**External I/O Cabling List and Details**

| Cable Description | Length (M) | Port/From | To |
|---|---|---|---|
| None-Shielded Telephone Cable | 2.0 | RJ45 Port/EUT | Telephone Simulator RJ45 Port |
| None-Shielded Telephone Cable | 2.0 | RJ45 Port/Simulator | Telephone RJ45 Port/Panasonic |

# SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: *33750*.

| FCC RULES | DESCRIPTION OF TEST | RESULT |
|---|---|---|
| §2.1091 | RF Exposure | Pass |
| §15.203 | Antenna Requirement | Pass |
| § 15.207 (a) | Conducted Emissions | Pass |
| §15.209 (a) | Spurious Emission | Pass |
| §15.247 (a)(2) | 6 dB Bandwidth | Pass |
| §15.247 (b)(3) | Maximum Peak Output Power | Pass |
| § 15.247 (c) | 100 kHz Bandwidth of Frequency Band Edge | Pass |
| §15.247 (d) | Peak Power Spectral Density | Pass |
| §15.205 | Restricted Band | Pass |

# §15.203 - ANTENNA REQUIREMENT

**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.

**Antenna Connected Construction**

The directional gain of antenna used for transmitting is 0 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

# §15.207(a) - CONDUCTED EMISSIONS

**Measurement Uncertainty**

All measurements involve certain levels of uncertainties. 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.

**EUT Setup**

The measurement was performed in the shield room, using the same setup per ANSI C63.4-2001 measurement procedure. The specification used was FCC 15 Subpart B 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.

**Spectrum Analyzer Setup**

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30Mhz.

**Test Equipment List and Details**

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|---|---|---|---|---|
| Rohde & Schwarz | Artificial LISN | ESH2-Z5 | 871884/039 | 2003-03-28 |
| Rohde & Schwarz | EMI Test Receiver | ESCS30 | 100176 | 2003-05-06 |

*** Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

**Test Procedure**

During the conducted emission test, the power cord of the EUT 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**".

**Summary of Test Results**

According to the recorded data in following table, the EUT complies with the FCC Conducted margin for a Class B device, with the *worst* margin reading of:

-37.5 dB at 7.570 in the Neutral mode

**Environmental Conditions**

| | |
|---|---|
| Temperature: | 16° C |
| Relative Humidity: | 48% |
| ATM Pressure: | 1032 mbar |

**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 |
| 7.570 | 12.5 | AVG | Neutral | 50 | -37.5 |
| 4.880 | 4.2 | AVG | Line | 46 | -41.8 |
| 4.880 | 4.0 | AVG | Neutral | 46 | -42.0 |
| 7.570 | 5.6 | AVG | Line | 50 | -44.4 |
| 7.570 | 14.3 | QP | Neutral | 60 | -45.7 |
| 0.160 | 4.8 | AVG | Neutral | 53 | -48.2 |
| 0.165 | 3.9 | AVG | Line | 53 | -49.1 |
| 0.165 | 13.1 | QP | Line | 63 | -49.9 |
| 4.880 | 4.5 | QP | Line | 56 | -51.5 |
| 4.880 | 4.4 | QP | Neutral | 56 | -51.6 |
| 0.160 | 10.5 | QP | Neutral | 63 | -52.5 |
| 7.570 | 5.7 | QP | Line | 60 | -54.3 |

**Plot of Conducted Emissions Test Data**

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

Bay Area Compliance Laboratory Corp 11. Mar 04 16:06

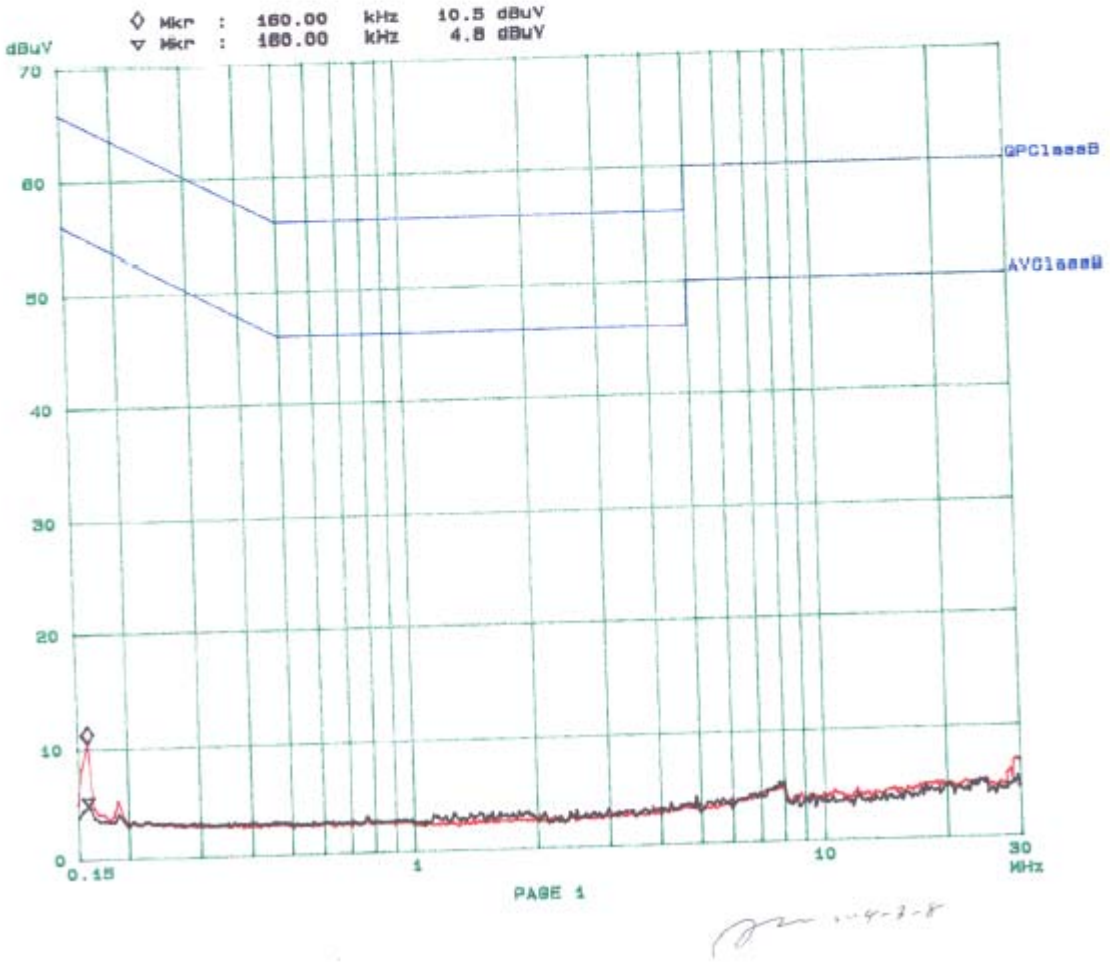
Class B

EUT: PMP3375
Manuf: Lionda
Op Cond: Normal
Operator: Ming
Comment: N

Scan Settings (3 Ranges)

| Frequencies | | | Receiver Settings | | | | |
|---|---|---|---|---|---|---|---|
| Start | Stop | Step | IF BW | Detector | M-Time | Atten | Preamp |
| 150k | 1M | 5k | 9k | QP+AV | 20ms | 15dBLN | OFF |
| 1M | 5M | 10k | 9k | QP+AV | 1ms | 15dBLN | OFF |
| 5M | 30M | 100k | 9k | QP+AV | 1ms | 15dBLN | OFF |

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




PAGE 1

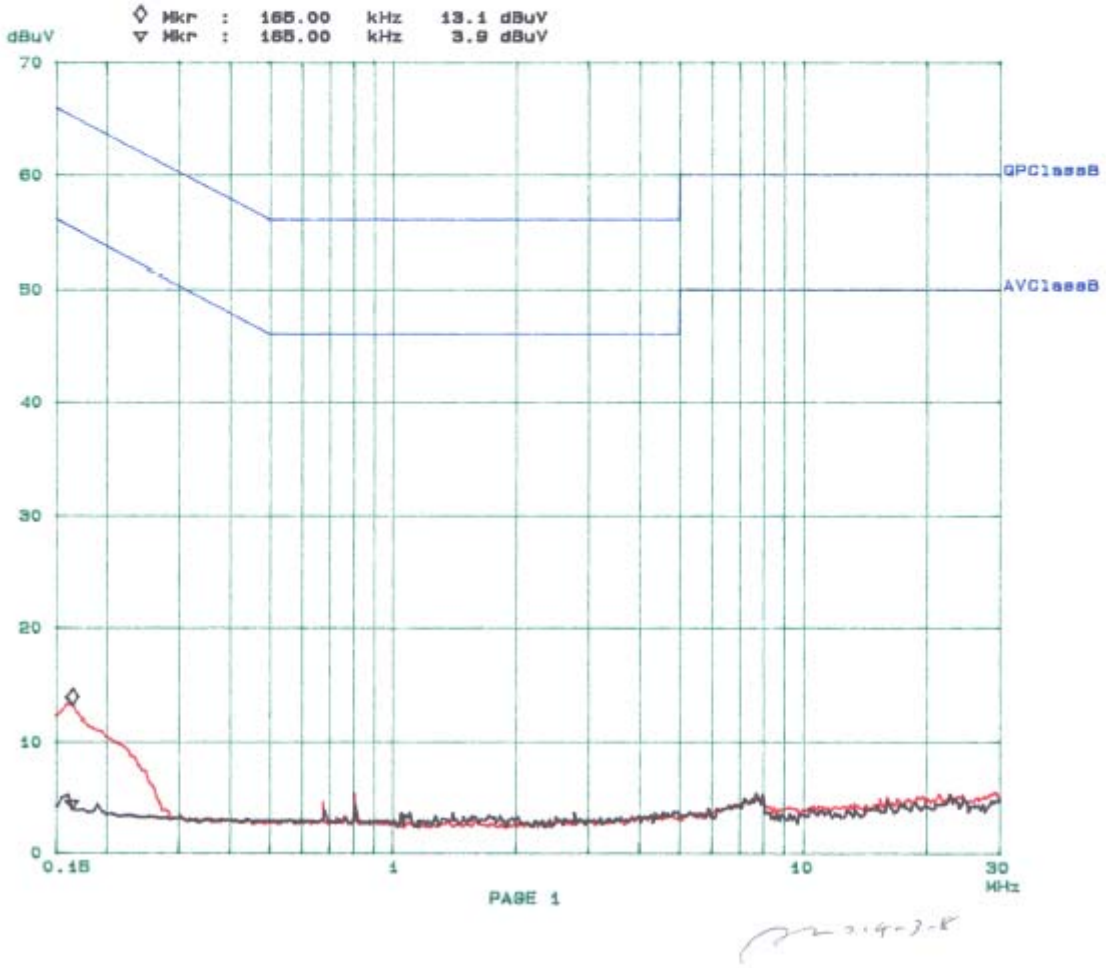
Bay Area Compliance Laboratory Corp 11. Mar 04 15:50
Class B

EUT: PMP3375
Manuf: Lionda
Op Cond: Normal
Operator: Mina
Comment: L

Scan Settings (3 Ranges)

| Frequencies | | | Receiver Settings | | | | |
|---|---|---|---|---|---|---|---|
| Start | Stop | Step | IF BW | Detector | M-Time | Atten | Preamp |
| 150k | 1M | 5k | 9k | QP+AV | 20ms | 15dBLN | OFF |
| 1M | 5M | 10k | 9k | QP+AV | 1ms | 15dBLN | OFF |
| 5M | 30M | 100k | 9k | QP+AV | 1ms | 15dBLN | OFF |

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




PAGE 1

2.4-3-E

# §15.209(a) - SPURIOUS EMISSION

**Standard Applicable**

According to §15.209 (a), except as provided elsewhere in the subpart of 15.209, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field strength (microvolts/meter) | Measurement distance (meters) |
|---|---|---|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490-1.705 | 24000/F(kHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 ** | 3 |
| 88-216 | 150 ** | 3 |
| 216-960 | 200 ** | 3 |
| Above 960 | 500 | 3 |

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241

**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 on a bench 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.

**Equipment Lists**

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|---|---|---|---|---|
| HP | Analyzer, Spectrum | 8565EC | 3946A00131 | 2003-06-30 |

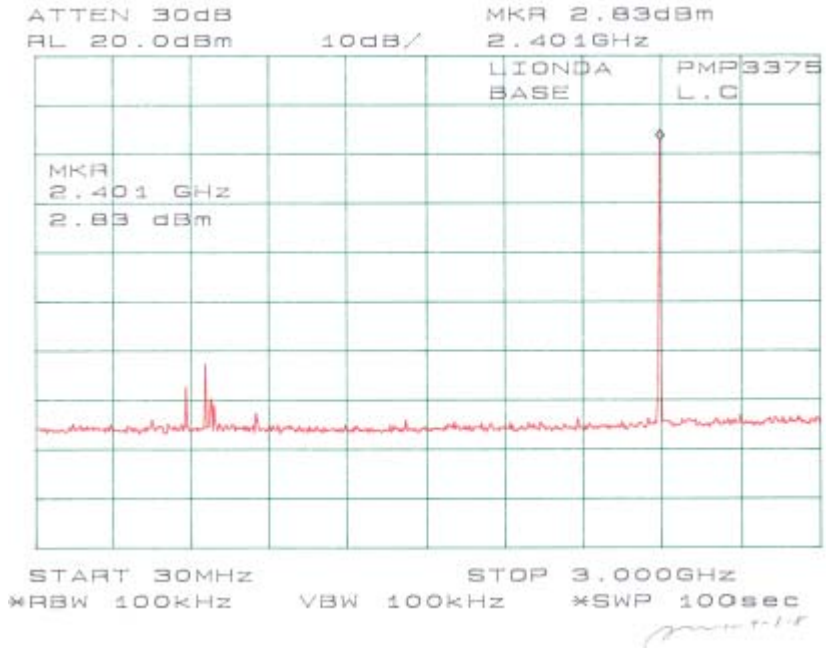
*** Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

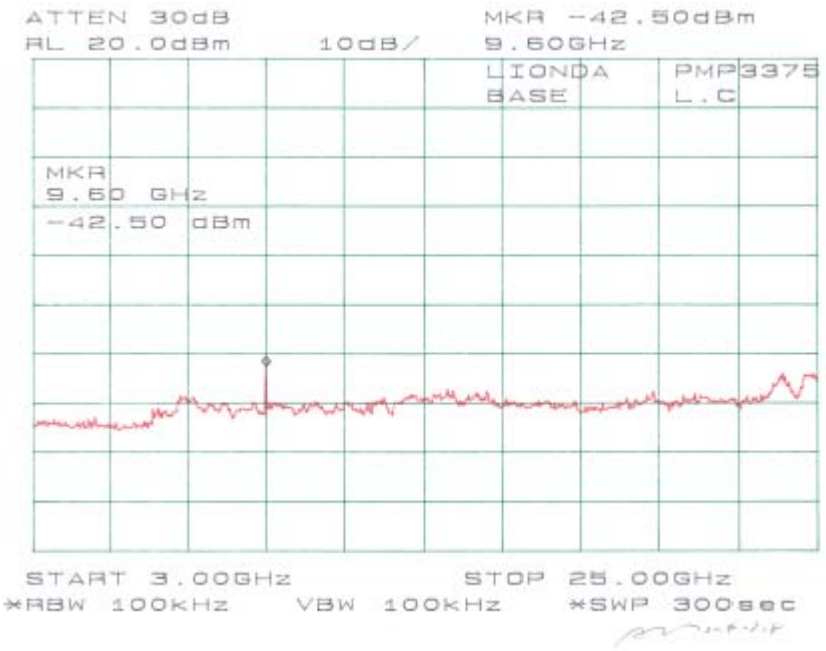
**Measurement Result**

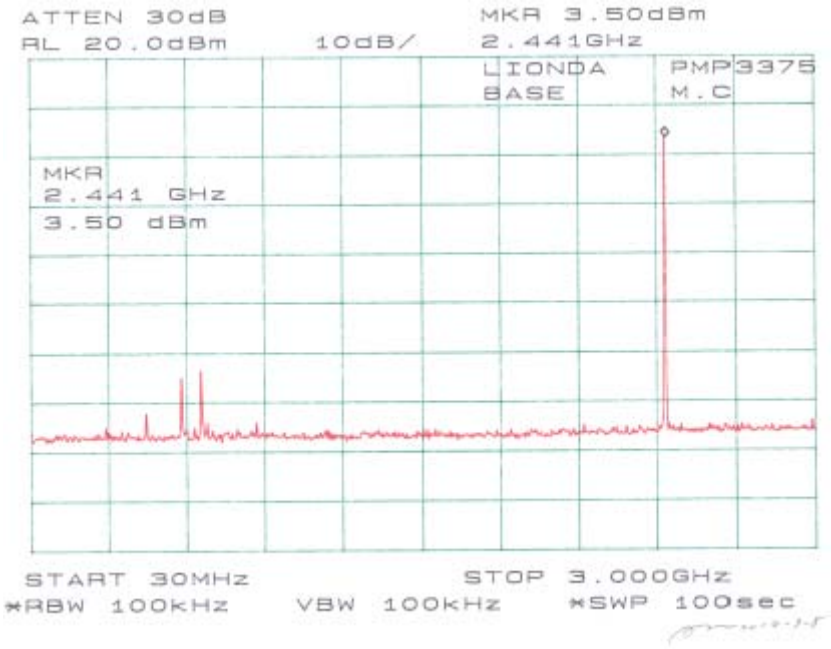
Please refer to following pages for plots of spurious emission.

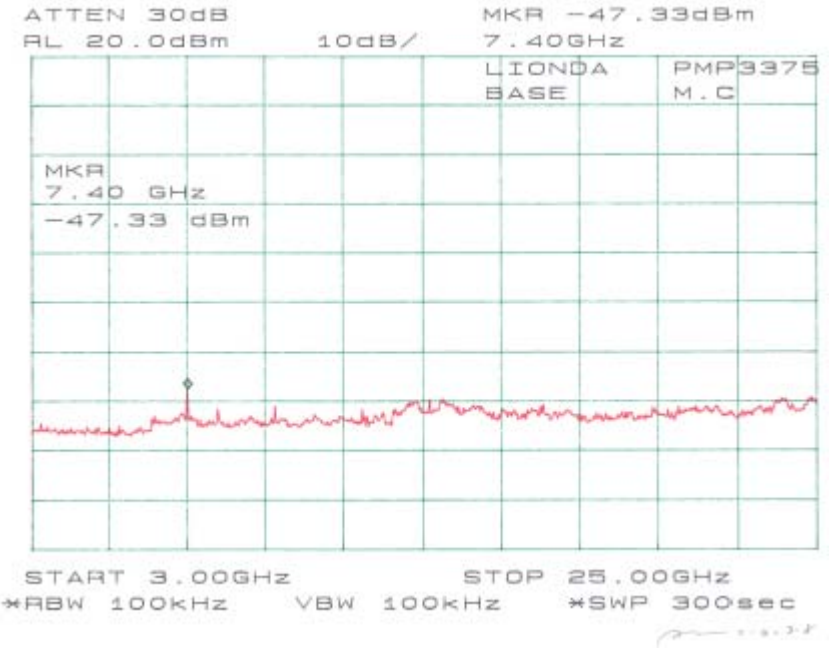
**Environmental Conditions**

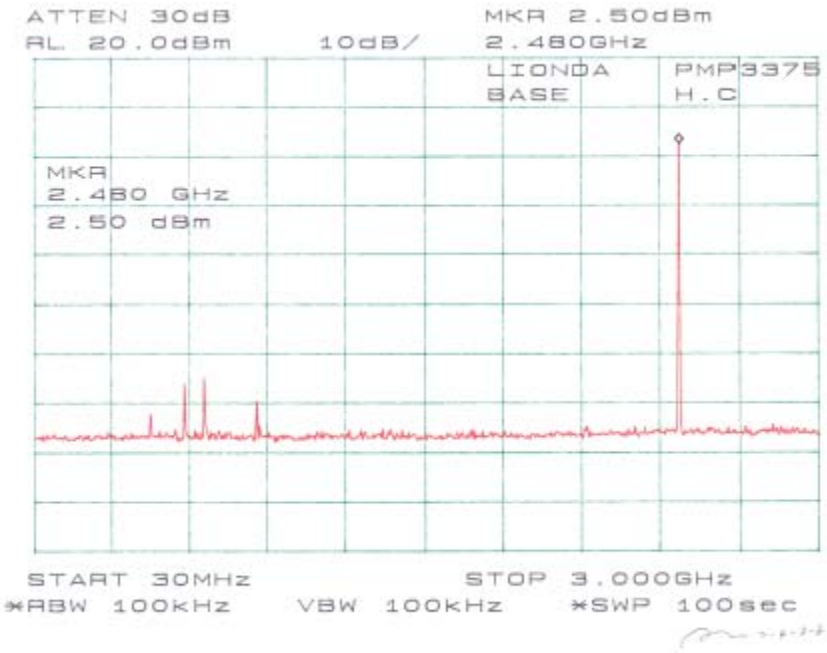
| | |
|---|---|
| Temperature: | 16° C |
| Relative Humidity: | 48% |
| ATM Pressure: | 1032 mbar |

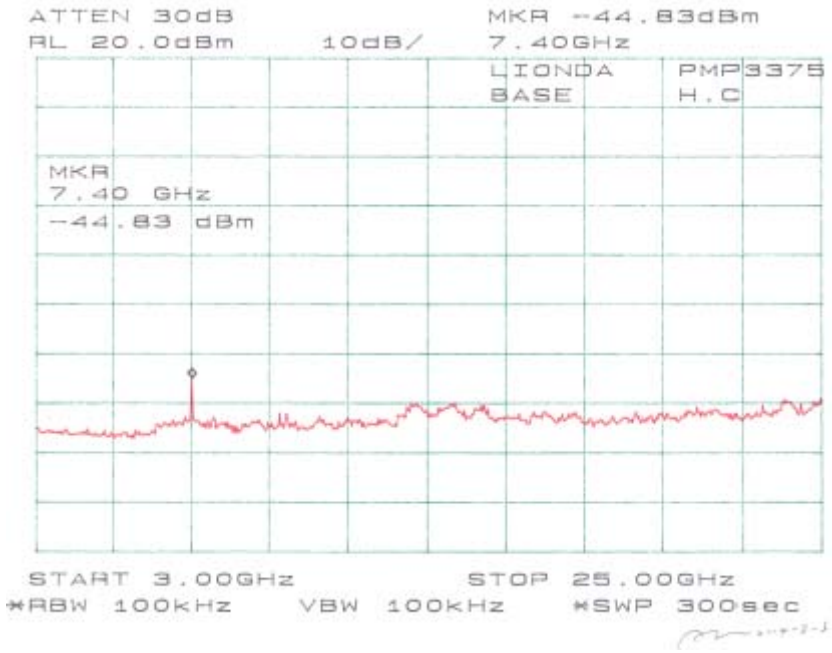

ATTEN 30dB
RL 20.0dBm
10dB/
MKR 2.83dBm
2.401GHz
LIONDA
BASE
PMP3375
L.C
MKR
2.401 GHz
2.83 dBm
START 30MHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec

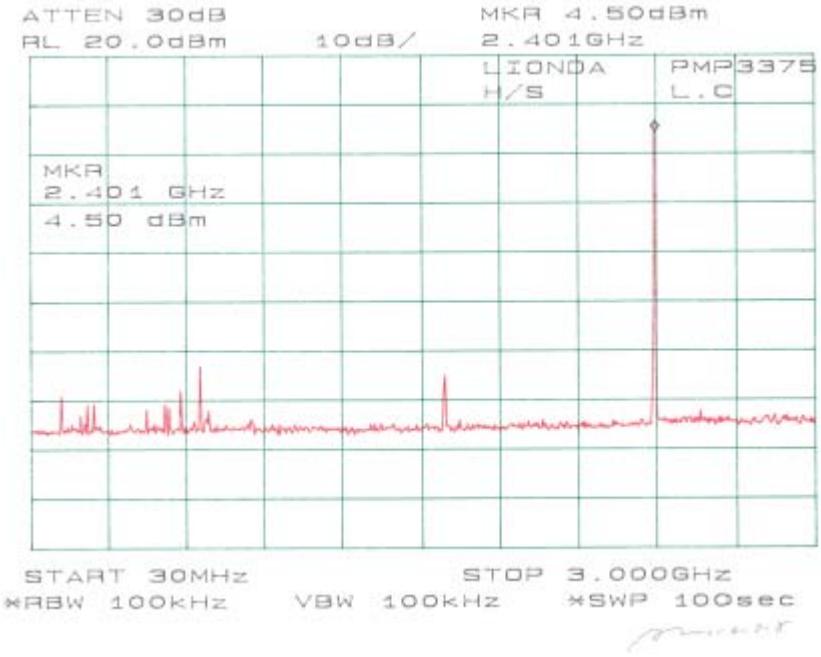

ATTEN 30dB
RL 20.0dBm
10dB/
MKR -42.50dBm
9.60GHz
LIONDA
BASE
PMP3375
L.C
MKR
9.60 GHz
-42.50 dBm
START 3.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 300sec

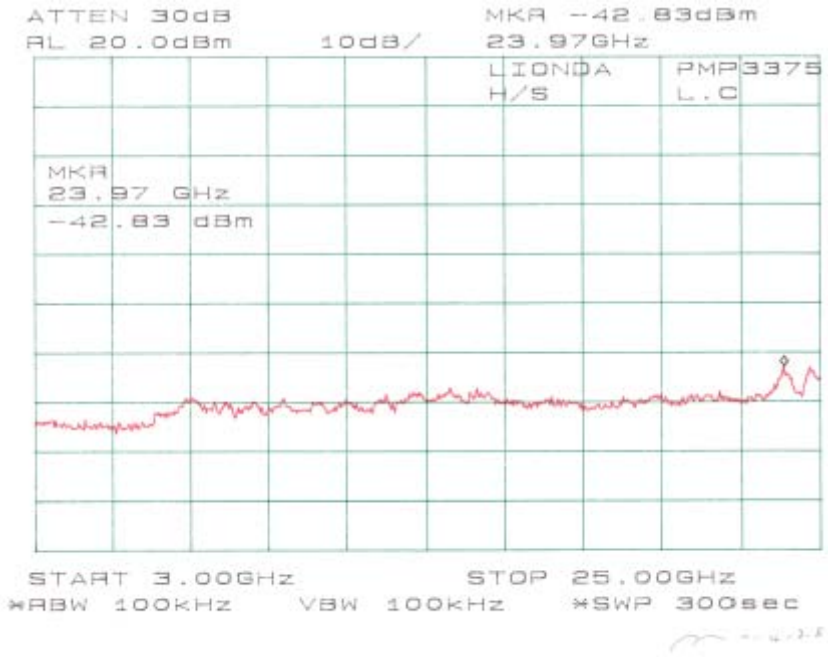

ATTEN 30dB
RL 20.0dBm
10dB/
MKR 3.50dBm
2.441GHz
LIONDA
BASE
PMP3375
M.C
MKR
2.441 GHz
3.50 dBm
START 30MHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec

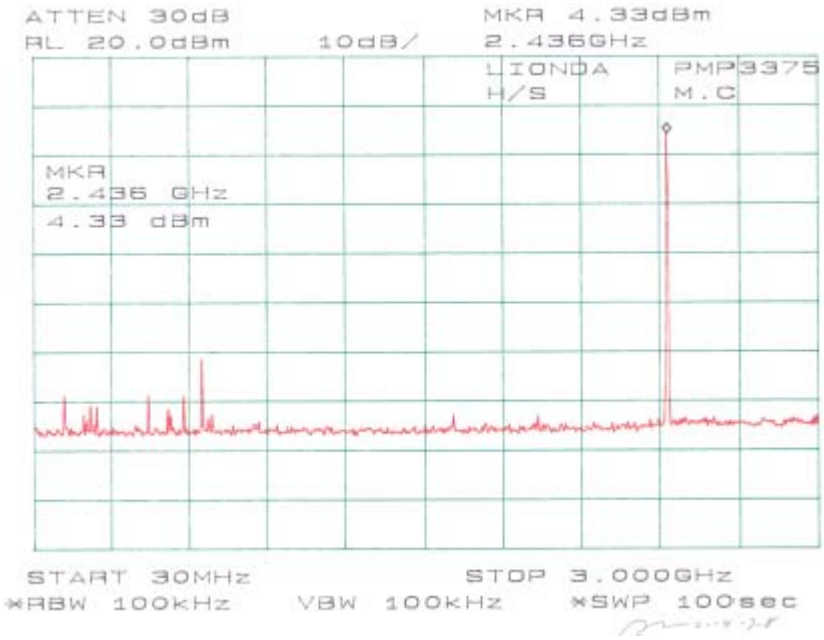

ATTEN 30dB
RL 20.0dBm
10dB/
MKR -47.33dBm
7.40GHz
LIONDA
BASE
PMP3375
M.C
MKR
7.40 GHz
-47.33 dBm
START 3.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 300sec

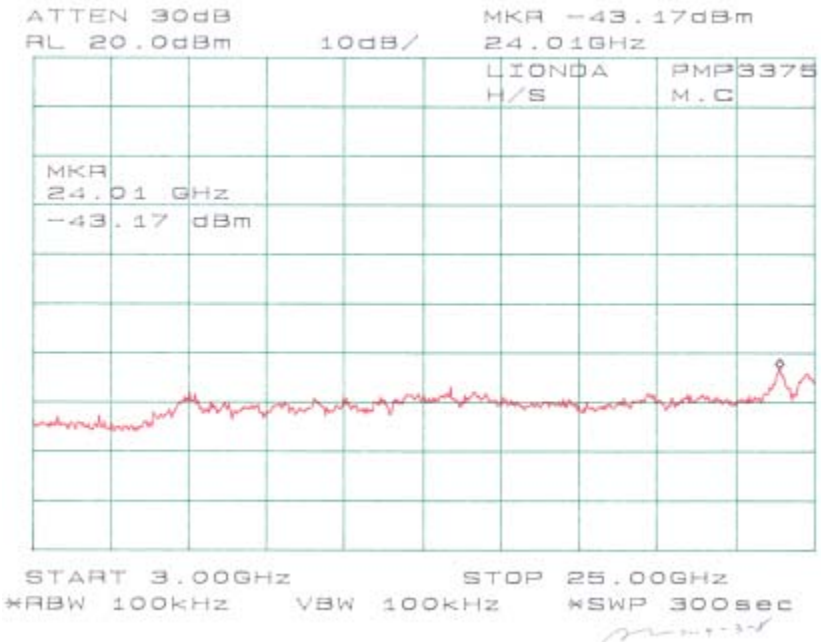

ATTEN 30dB
RL 20.0dBm
10dB/
MKR 2.50dBm
2.480GHz
LIONDA
BASE
PMP3375
H.C
MKR
2.480 GHz
2.50 dBm
START 30MHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec

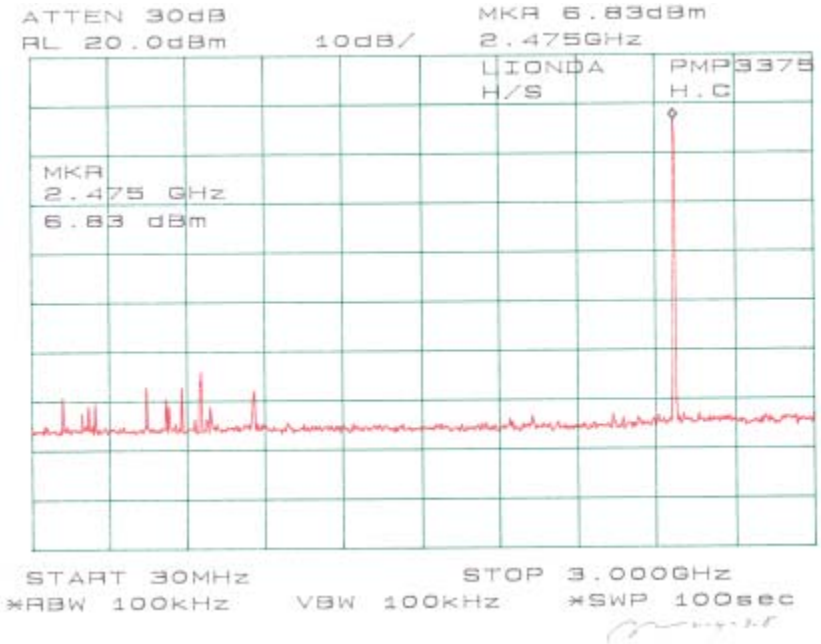

ATTEN 30dB
RL 20.0dBm
10dB/
MKR -44.83dBm
7.40GHz
LIONDA
BASE
PMP3375
H.C
MKR
7.40 GHz
-44.83 dBm
START 3.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 300sec

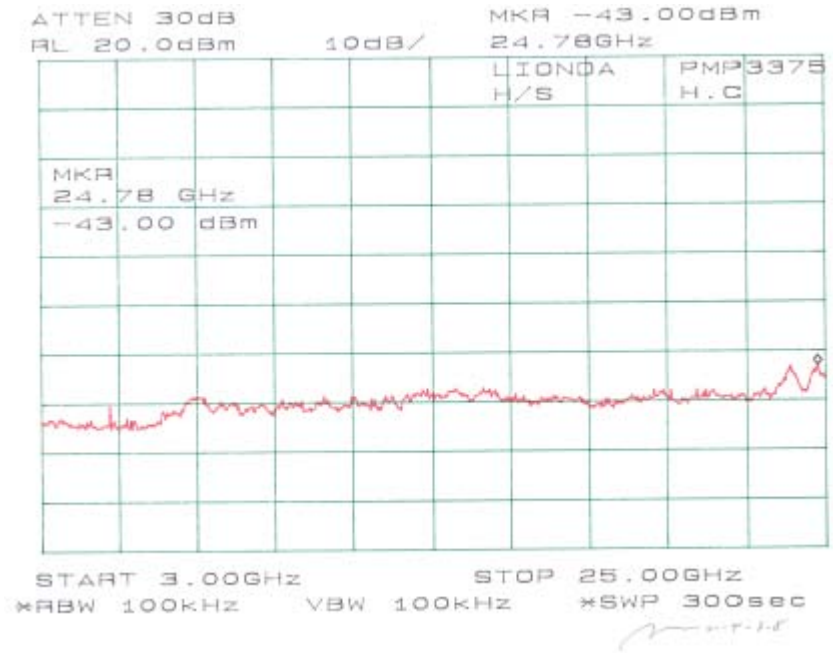

ATTEN 30dB
RL 20.0dBm
10dB/
MKR 4.50dBm
2.401GHz
LIONDA
H/S
PMP3375
L.C
MKR
2.401 GHz
4.50 dBm
START 30MHz
STOP 3.000GHz
#RBW 100kHz
VBW 100kHz
#SWP 100sec


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -42.83dBm
23.97GHz
LIONDA
H/S
PMP3375
L.C
MKR
23.97 GHz
-42.83 dBm
START 3.00GHz
STOP 25.00GHz
#RBW 100kHz
VBW 100kHz
#SWP 300sec


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 4.33dBm
2.436GHz
LIONDA
H/S
PMP3375
M.C
MKR
2.436 GHz
4.33 dBm
START 30MHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -43.17dBm
24.01GHz
LIONDA
H/S
PMP3375
M.C
MKR
24.01 GHz
-43.17 dBm
START 3.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 300sec


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 6.83dBm
2.475GHz
LIONDA
H/S
PMP3375
H.C
MKR
2.475 GHz
6.83 dBm
START 30MHz
STOP 3.000GHz
*RBW 100kHz
VBW 100kHz
*SWP 100sec


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -43.00dBm
24.78GHz
LIONDA
H/S
PMP3375
H.C
MKR
24.78 GHz
-43.00 dBm
START 3.00GHz
STOP 25.00GHz
*RBW 100kHz
VBW 100kHz
*SWP 300sec

# §15.209(f) - SPURIOUS RADIATED EMISSION

**Measurement Uncertainty**

All measurements involve certain levels of uncertainties. 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.

According to §15.205, 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 – 12.57725 | 240 – 285 | 3345.8 – 3358 | 36.43 – 36.5 |
| 13.36 – 13.41 | 322 – 335.4 | 3600 – 4400 | ([2]) |

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

Except as provided in paragraph (d) and (e), the filed strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

According to §15.209, the device shall meet radiated emission general requirements.

Except for Class A device, the filed strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

| Frequency of Emission (MHz) | Field Strength (Microvolts/meter) | (dBμV/meter) |
|---|---|---|
| 30 - 88 | 100 | 40 |
| 88 - 216 | 150 | 43.5 |
| 216 - 960 | 200 | 46 |
| Above 960 | 500 | 54 |

**EUT Setup**

The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the ANSI C63.4-2001. The specification used was the FCC 15.209 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.

**Spectrum Analyzer Setup**

According to FCC Rules, 47 CFR, Section 15.33, the frequency was investigated from 30 to 2500 MHz.

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

| ***Frequency Range*** | ***RBW*** | ***Video B/W*** |
|---|---|---|
| Below 30MHz | 10kHz | 10kHz |
| 30 – 1000MHz | 100kHz | 100kHz |
| Above 1000MHz | 1MHz | 1MHz |

**Test Equipment List and Details**

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|---|---|---|---|---|
| HP | Amplifier, Microwave | 8449B | 3147A00400 | 2003-03-14 |
| HP | Amplifier, Pre | 8447E | 1937A01057 | 2003-08-04 |
| HP | Amplifier, Pre | 8447E | 1937A01046 | 2003-08-02 |
| HP | Analyzer, Spectrum | 8565EC | 3946A00131 | 2003-06-30 |
| ETS | Antenna, Biconical | 3110B | 9603-2315 | 2003-10-11 |
| A.R.A. | Antenna, Horn, DRG | DRG-118/A | 1132 | 2003-09-30 |
| A. H. Systems | Antenna, Horn, DRG | SAS-200/571 | 2455-261 | 2003-08-01 |
| ETS | Antenna, logperiodic | 3148 | 0004-1155 | 2003-10-11 |
| EMCO | Antenna, Loop, H-Field Gain/AF | 6512 | 00029604 | 2004-02-12 |

*** Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

**Test Procedure**

For the radiated emissions test, the EUT, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings 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.

**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 Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. - FCC 15.209 Limit

**Summary of Test Results**

According to the data in section 12.7, 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:

**Environmental Conditions**

| | |
|---|---|
| Temperature: | 16° C |
| Relative Humidity: | 48% |
| ATM Pressure: | 1032 mbar |

***Base Unit:***

**-4.5 dB** at **9609.216 MHz** in the **Horizontal** polarization, Low Channel

**-5.3 dB** at **9764.864 MHz** in the **Horizontal** polarization, Middle Channel

**-5.5 dB** at **9920.512 MHz** in the **Horizontal** polarization, High Channel

**-10.3 dB** at **670.20 MHz** in the **Horizontal** polarization, Unwanted Emission

***Handset Unit:***

**-12.7 dB** at **7206.91 MHz** in the **Vertical** polarization, Low Channel

**-13.0 dB** at **7323.648 MHz** in the **Vertical** polarization, Middle Channel

**-11.0 dB** at **2483.500 MHz** in the **Vertical** polarization, High Channel

**-9.3 dB** at **794.99 MHz** in the **Horizontal** polarization, Unwanted Emission

**Radiated Emission Test Result for Base Unit**

| INDICATED | | | TABLE | ANTENNA | | CORRECTION FACTOR | | | CORRECTED AMPLITUDE | FCC 15 SUBPART C | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| Low Channel, 1-25GHz | | | | | | | | | | | |
| 2402.304 | 100.1 | Fund/Peak | 270 | 1.5 | v | 28.1 | 3.4 | 35.2 | 96.4 | | |
| 2402.304 | 102.7 | Fund/Peak | 180 | 1.8 | h | 28.1 | 3.4 | 35.2 | 99.0 | | |
| 2402.304 | 71.8 | Fund/Ave | 270 | 1.5 | v | 28.1 | 3.4 | 35.2 | 68.1 | | |
| 2402.304 | 73.2 | Fund/Ave | 180 | 1.8 | h | 28.1 | 3.4 | 35.2 | 69.5 | | |
| 9609.216 | 39.7 | Ave | 100 | 1.8 | h | 38.4 | 7.0 | 35.6 | 49.5 | 54 | -4.5 |
| 9609.216 | 38.2 | Ave | 90 | 1.0 | v | 38.4 | 7.0 | 35.6 | 48.0 | 54 | -6.0 |
| 7206.912 | 39.4 | Ave | 90 | 1.0 | v | 36.3 | 6.0 | 35.5 | 46.2 | 54 | -7.8 |
| 7206.912 | 37.8 | Ave | 100 | 1.8 | h | 36.3 | 6.0 | 35.5 | 44.6 | 54 | -9.4 |
| 9609.216 | 53.4 | Peak | 100 | 1.8 | h | 38.4 | 7.0 | 35.6 | 63.2 | 74 | -10.8 |
| 9609.216 | 52.3 | Peak | 90 | 1.0 | v | 38.4 | 7.0 | 35.6 | 62.1 | 74 | -11.9 |
| 7206.912 | 53.9 | Peak | 90 | 1.0 | v | 36.3 | 6.0 | 35.5 | 60.7 | 74 | -13.3 |
| 7206.912 | 52.7 | Peak | 100 | 1.8 | h | 36.3 | 6.0 | 35.5 | 59.5 | 74 | -14.5 |
| 4804.608 | 32.9 | Ave | 250 | 1.2 | v | 32.5 | 4.9 | 35.8 | 34.5 | 54 | -19.5 |
| 4804.608 | 31.5 | Ave | 60 | 1.6 | h | 32.5 | 4.9 | 35.8 | 33.1 | 54 | -20.9 |
| 4804.608 | 45.2 | Peak | 250 | 1.2 | v | 32.5 | 4.9 | 35.8 | 46.8 | 74 | -27.2 |
| 4804.608 | 44.6 | Peak | 60 | 1.6 | h | 32.5 | 4.9 | 35.8 | 46.2 | 74 | -27.8 |
| Middle Channel, 1-25GHz | | | | | | | | | | | |
| 2441.216 | 96.8 | Fund/Peak | 30 | 1.6 | v | 28.1 | 3.4 | 35.2 | 93.1 | | |
| 2441.216 | 100.5 | Fund/Peak | 310 | 1.8 | h | 28.1 | 3.4 | 35.2 | 96.8 | | |
| 2441.216 | 67.2 | Fund/Ave | 30 | 1.6 | v | 28.1 | 3.4 | 35.2 | 63.5 | | |
| 2441.216 | 71.4 | Fund/Ave | 310 | 1.8 | h | 28.1 | 3.4 | 35.2 | 67.7 | | |
| 9764.864 | 38.9 | Ave | 330 | 1.6 | h | 38.4 | 7.0 | 35.6 | 48.7 | 54 | -5.3 |
| 9764.864 | 37.6 | Ave | 210 | 1.8 | v | 38.4 | 7.0 | 35.6 | 47.4 | 54 | -6.6 |
| 7323.648 | 38.7 | Ave | 30 | 1.5 | v | 36.3 | 6.0 | 35.5 | 45.5 | 54 | -8.5 |
| 7323.648 | 38.1 | Ave | 330 | 1.6 | h | 36.3 | 6.0 | 35.5 | 44.9 | 54 | -9.1 |
| 9764.864 | 52.8 | Peak | 330 | 1.6 | h | 38.4 | 7.0 | 35.6 | 62.6 | 74 | -11.4 |
| 9764.864 | 51.5 | Peak | 210 | 1.8 | v | 38.4 | 7.0 | 35.6 | 61.3 | 74 | -12.7 |
| 7323.648 | 53.6 | Peak | 30 | 1.5 | v | 36.3 | 6.0 | 35.5 | 60.4 | 74 | -13.6 |
| 7323.648 | 52.9 | Peak | 330 | 1.6 | h | 36.3 | 6.0 | 35.5 | 59.7 | 74 | -14.3 |
| 4882.432 | 32.2 | Ave | 90 | 1.5 | v | 32.5 | 4.9 | 35.8 | 33.8 | 54 | -20.2 |
| 4882.432 | 31.3 | Ave | 110 | 1.8 | h | 32.5 | 4.9 | 35.8 | 32.9 | 54 | -21.1 |
| 4882.432 | 44.9 | Peak | 90 | 1.5 | v | 32.5 | 4.9 | 35.8 | 46.5 | 74 | -27.5 |
| 4882.432 | 43.5 | Peak | 110 | 1.8 | h | 32.5 | 4.9 | 35.8 | 45.1 | 74 | -28.9 |

| High Channel, 1-25GHz | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2480.128 | 95.7 | Fund/Peak | 180 | 1.5 | v | 28.1 | 3.4 | 35.2 | 92.0 | | |
| 2480.128 | 101.4 | Fund/Peak | 60 | 1.2 | h | 28.1 | 3.4 | 35.2 | 97.7 | | |
| 2480.128 | 66.5 | Fund/Ave | 180 | 1.5 | v | 28.1 | 3.4 | 35.2 | 62.8 | | |
| 2480.128 | 69.8 | Fund/Ave | 60 | 1.2 | h | 28.1 | 3.4 | 35.2 | 66.1 | | |
| 9920.512 | 38.7 | Ave | 120 | 1.8 | h | 38.4 | 7.0 | 35.6 | 48.5 | 54 | -5.5 |
| 9920.512 | 37.6 | Ave | 60 | 1.5 | v | 38.4 | 7.0 | 35.6 | 47.4 | 54 | -6.6 |
| 7440.384 | 38.7 | Ave | 210 | 1.4 | v | 36.3 | 6.0 | 35.5 | 45.5 | 54 | -8.5 |
| 7440.384 | 37.2 | Ave | 290 | 1.8 | h | 36.3 | 6.0 | 35.5 | 44.0 | 54 | -10.0 |
| 9920.512 | 52.9 | Peak | 120 | 1.8 | h | 38.4 | 7.0 | 35.6 | 62.7 | 74 | -11.3 |
| 2483.500 | 46.1 | Ave | 60 | 1.8 | h | 28.1 | 3.4 | 35.6 | 42.0 | 54 | -12.1 |
| 2483.500 | 45.7 | Ave | 0 | 1.5 | v | 28.1 | 3.4 | 35.6 | 41.6 | 54 | -12.5 |
| 9920.512 | 51.5 | Peak | 60 | 1.5 | v | 38.4 | 7.0 | 35.6 | 61.3 | 74 | -12.7 |
| 2483.500 | 65.2 | Peak | 60 | 1.8 | h | 28.1 | 3.4 | 35.6 | 61.1 | 74 | -13.0 |
| 7440.384 | 53.6 | Peak | 210 | 1.4 | v | 36.3 | 6.0 | 35.5 | 60.4 | 74 | -13.6 |
| 2483.500 | 64.1 | Peak | 0 | 1.5 | v | 28.1 | 3.4 | 35.6 | 60.0 | 74 | -14.1 |
| 7440.384 | 52.1 | Peak | 290 | 1.8 | h | 36.3 | 6.0 | 35.5 | 58.9 | 74 | -15.1 |
| 4960.256 | 32.2 | Ave | 0 | 1.2 | v | 32.5 | 4.9 | 35.8 | 33.8 | 54 | -20.2 |
| 4960.256 | 30.9 | Ave | 90 | 1.4 | h | 32.5 | 4.9 | 35.8 | 32.5 | 54 | -21.5 |
| 4960.256 | 44.9 | Peak | 0 | 1.2 | v | 32.5 | 4.9 | 35.8 | 46.5 | 74 | -27.5 |
| 4960.256 | 43.3 | Peak | 90 | 1.4 | h | 32.5 | 4.9 | 35.8 | 44.9 | 74 | -29.1 |

| Indicated | | | Table | Antenna | | Correction Factor | | | FCC 15 Subpart B | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency | Ampl. | Direction | Height | Polar | Antenna | Cable Loss | Amp. | Corr. Ampl. | Limit | Margin |
| MHz | dBμV/m | Degree | Meter | H/V | dBμV/m | dBμV/m | dB | dBμV/m | dBμV/m | dB |
| 670.20 | 38.1 | 230 | 1.2 | h | 21.2 | 3.2 | 26.8 | 35.7 | 46 | -10.3 |
| 169.68 | 39.2 | 290 | 1.5 | h | 13.0 | 1.8 | 25.7 | 28.3 | 43.5 | -15.2 |
| 271.53 | 38.8 | 270 | 1.8 | v | 13.3 | 2.2 | 26.0 | 28.3 | 46 | -17.7 |
| 55.22 | 34.6 | 30 | 1.5 | v | 9.8 | 1.7 | 25.7 | 20.4 | 40 | -19.6 |
| 261.83 | 35.9 | 15 | 1.8 | v | 13.4 | 2.2 | 25.9 | 25.6 | 46 | -20.4 |
| 266.68 | 35.2 | 80 | 1.6 | h | 13.4 | 2.2 | 25.9 | 24.9 | 46 | -21.1 |

FUND = Fundamental
AVG = average

**Radiated Emission Test Result for Handset Unit**

| INDICATED | | | TABLE | ANTENNA | | CORRECTION FACTOR | | | CORRECTED AMPLITUDE | FCC 15 SUBPART C | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 |
| Low Channel, 1-25GHz | | | | | | | | | | | |
| 2402.30 | 108.3 | Fund/Peak | 90 | 1.5 | v | 28.1 | 3.4 | 35.2 | 104.6 | | |
| 2402.30 | 108.1 | Fund/Peak | 0 | 1.8 | h | 28.1 | 3.4 | 35.2 | 104.4 | | |
| 2402.30 | 72.6 | Fund/Ave | 90 | 1.5 | v | 28.1 | 3.4 | 35.2 | 68.9 | | |
| 2402.30 | 72.1 | Fund/Ave | 0 | 1.8 | h | 28.1 | 3.4 | 35.2 | 68.4 | | |
| 7206.91 | 34.5 | Ave | 200 | 1.2 | v | 36.3 | 6.0 | 35.5 | 41.3 | 54 | -12.7 |
| 7206.91 | 33.4 | Ave | 210 | 1.2 | h | 36.3 | 6.0 | 35.5 | 40.2 | 54 | -13.8 |
| 4804.61 | 33.8 | Ave | 90 | 1.5 | v | 32.5 | 4.9 | 35.8 | 35.4 | 54 | -18.6 |
| 4804.61 | 33.4 | Ave | 30 | 1.6 | h | 32.5 | 4.9 | 35.8 | 35.0 | 54 | -19.0 |
| 7206.91 | 45.7 | Peak | 200 | 1.2 | v | 36.3 | 6.0 | 35.5 | 52.5 | 74 | -21.5 |
| 7206.91 | 44.6 | Peak | 210 | 1.2 | h | 36.3 | 6.0 | 35.5 | 51.4 | 74 | -22.6 |
| 4804.61 | 46.3 | Peak | 90 | 1.5 | v | 32.5 | 4.9 | 35.8 | 47.9 | 74 | -26.1 |
| 4804.61 | 45.9 | Peak | 30 | 1.6 | h | 32.5 | 4.9 | 35.8 | 47.5 | 74 | -26.5 |
| Middle Channel, 1-25GHz | | | | | | | | | | | |
| 2441.216 | 107.9 | Fund/Peak | 270 | 1.8 | v | 28.1 | 3.4 | 35.2 | 104.2 | | |
| 2441.216 | 107.7 | Fund/Peak | 180 | 1.5 | h | 28.1 | 3.4 | 35.2 | 104.0 | | |
| 2441.216 | 71.2 | Fund/Ave | 270 | 1.8 | v | 28.1 | 3.4 | 35.2 | 67.5 | | |
| 2441.216 | 70.8 | Fund/Ave | 180 | 1.5 | h | 28.1 | 3.4 | 35.2 | 67.1 | | |
| 7323.648 | 34.2 | Ave | 110 | 1.5 | v | 36.3 | 6.0 | 35.5 | 41.0 | 54 | -13.0 |
| 7323.648 | 33.0 | Ave | 150 | 1.2 | h | 36.3 | 6.0 | 35.5 | 39.8 | 54 | -14.2 |
| 4882.432 | 33.6 | Ave | 0 | 1.8 | v | 32.5 | 4.9 | 35.8 | 35.2 | 54 | -18.8 |
| 4882.432 | 33.1 | Ave | 270 | 1.6 | h | 32.5 | 4.9 | 35.8 | 34.7 | 54 | -19.3 |
| 7323.648 | 45.6 | Peak | 110 | 1.5 | v | 36.3 | 6.0 | 35.5 | 52.4 | 74 | -21.6 |
| 7323.648 | 44.5 | Peak | 150 | 1.2 | h | 36.3 | 6.0 | 35.5 | 51.3 | 74 | -22.7 |
| 4882.432 | 45.9 | Peak | 0 | 1.8 | v | 32.5 | 4.9 | 35.8 | 47.5 | 74 | -26.5 |
| 4882.432 | 45.7 | Peak | 270 | 1.6 | h | 32.5 | 4.9 | 35.8 | 47.3 | 74 | -26.7 |

| High Channel, 1-25GHz | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2480.13 | 103.6 | Fund/Peak | 210 | 1.6 | v | 28.1 | 3.4 | 35.2 | 99.9 | | |
| 2480.13 | 101.7 | Fund/Peak | 90 | 1.8 | h | 28.1 | 3.4 | 35.2 | 98.0 | | |
| 2480.13 | 68.1 | Fund/Ave | 210 | 1.6 | v | 28.1 | 3.4 | 35.2 | 64.4 | | |
| 2480.13 | 67.2 | Fund/Ave | 90 | 1.8 | h | 28.1 | 3.4 | 35.2 | 63.5 | | |
| 2483.500 | 47.2 | Ave | 120 | 1.5 | v | 28.1 | 3.4 | 35.6 | 43.1 | 54 | -11.0 |
| 2483.500 | 46.3 | Ave | 310 | 1.8 | h | 28.1 | 3.4 | 35.6 | 42.2 | 54 | -11.9 |
| 2483.500 | 65.8 | Peak | 120 | 1.5 | v | 28.1 | 3.4 | 35.6 | 61.7 | 74 | -12.4 |
| 7440.38 | 34.2 | Ave | 60 | 1.5 | v | 36.3 | 6.0 | 35.5 | 41.0 | 54 | -13.0 |
| 2483.500 | 64.9 | Peak | 310 | 1.8 | h | 28.1 | 3.4 | 35.6 | 60.8 | 74 | -13.3 |
| 7440.38 | 33.0 | Ave | 0 | 1.2 | h | 36.3 | 6.0 | 35.5 | 39.8 | 54 | -14.2 |
| 4960.26 | 33.6 | Ave | 0 | 1.5 | v | 32.5 | 4.9 | 35.8 | 35.2 | 54 | -18.8 |
| 4960.26 | 33.1 | Ave | 45 | 2.0 | h | 32.5 | 4.9 | 35.8 | 34.7 | 54 | -19.3 |
| 7440.38 | 45.6 | Peak | 60 | 1.5 | v | 36.3 | 6.0 | 35.5 | 52.4 | 74 | -21.6 |
| 7440.38 | 44.5 | Peak | 0 | 1.2 | h | 36.3 | 6.0 | 35.5 | 51.3 | 74 | -22.7 |
| 4960.26 | 45.9 | Peak | 0 | 1.5 | v | 32.5 | 4.9 | 35.8 | 47.5 | 74 | -26.5 |
| 4960.26 | 45.7 | Peak | 45 | 2.0 | h | 32.5 | 4.9 | 35.8 | 47.3 | 74 | -26.7 |

| Indicated | | | Table | Antenna | | Correction Factor | | | FCC 15 Subpart B | |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency | Ampl. | Direction | Height | Polar | Antenna | Cable Loss | Amp. | Corr. Ampl. | Limit | Margin |
| MHz | dBμV/m | Degree | Meter | H/V | dBμV/m | dBμV/m | dB | dBμV/m | dBμV/m | dB |
| 794.99 | 37.2 | 110 | 1.3 | h | 22.6 | 3.6 | 26.7 | 36.7 | 46 | -9.3 |
| 998.06 | 31.9 | 60 | 1.5 | v | 23.8 | 4.2 | 26.7 | 33.2 | 46 | -12.8 |
| 262.80 | 41.4 | 90 | 2.0 | v | 13.4 | 2.2 | 25.9 | 31.1 | 46 | -14.9 |
| 30.02 | 34.2 | 120 | 1.5 | h | 14.9 | 0.8 | 25.7 | 24.2 | 40 | -15.8 |
| 36.79 | 34.8 | 290 | 1.5 | v | 13.4 | 1.0 | 25.7 | 23.5 | 40 | -16.5 |
| 50.37 | 35.1 | 15 | 1.6 | h | 10.2 | 1.0 | 25.7 | 20.6 | 40 | -19.4 |

FUND = Fundamental
AVG = average

# §15.247(a)(2) – 6 DB BANDWIDTH

**Standard Applicable**

According to §15.247(a)(2), for digital modulation technicques, the minimum 6dB bandwidth shall be at least 500 kHz.

**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. (6 dB bandwidth for DTS)
4. Repeat above procedures until all frequencies measured were complete.

**Equipment Lists**

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|---|---|---|---|---|
| HP | Analyzer, Spectrum | 8565EC | 3946A00131 | 2003-06-30 |

*** Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

**Measurement Result**

**Environmental Conditions**

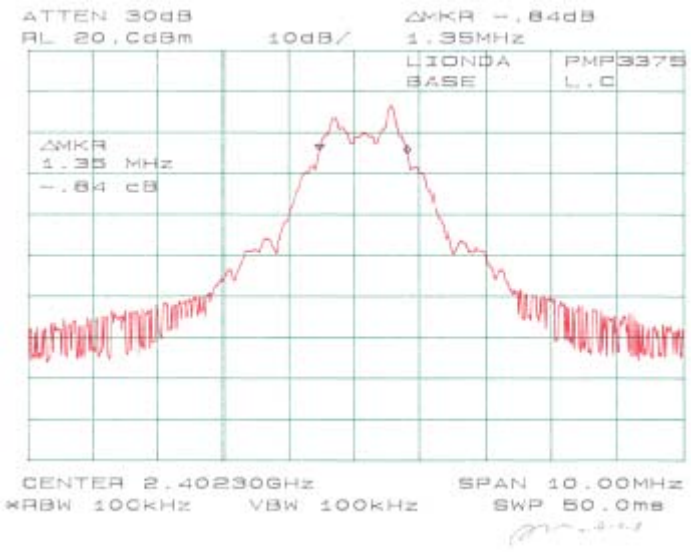
| | |
|---|---|
| Temperature: | 16° C |
| Relative Humidity: | 48% |
| ATM Pressure: | 1032 mbar |

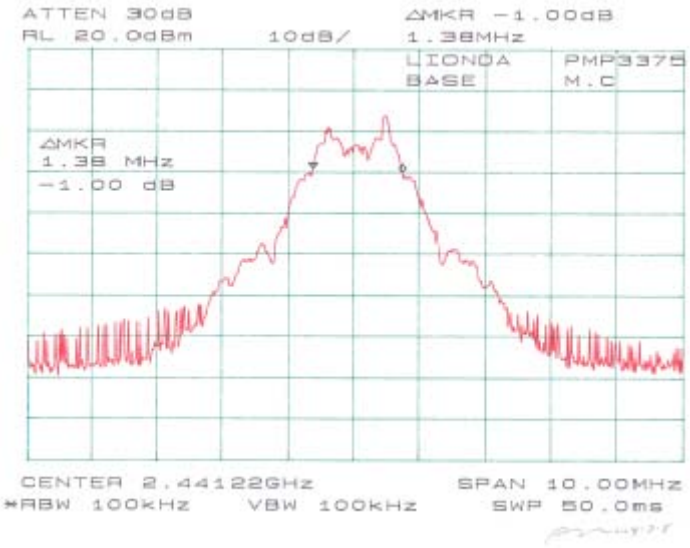
**Test Result for Base**

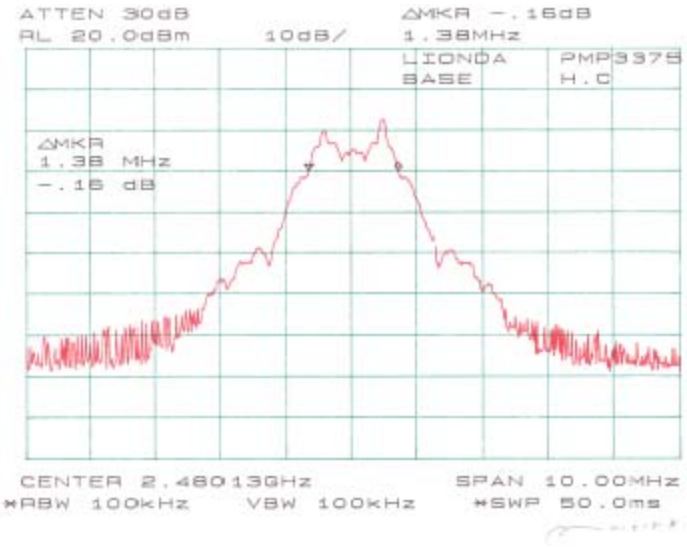
| Channel | Frequency (MHz) | Measured (MHz) | Measured (kHz) | Standard (kHz) | Result |
|---|---|---|---|---|---|
| Low | 2402.30 | 1.35 | 1350 | ≥ 500 | Pass |
| Mid | 2441.22 | 1.38 | 1380 | ≥ 500 | Pass |
| High | 2480.13 | 1.38 | 1380 | ≥ 500 | Pass |

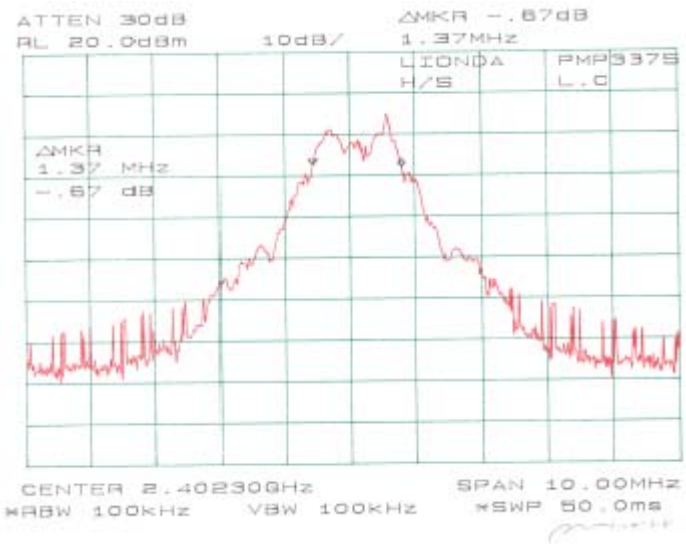
**Test Result for Handset**

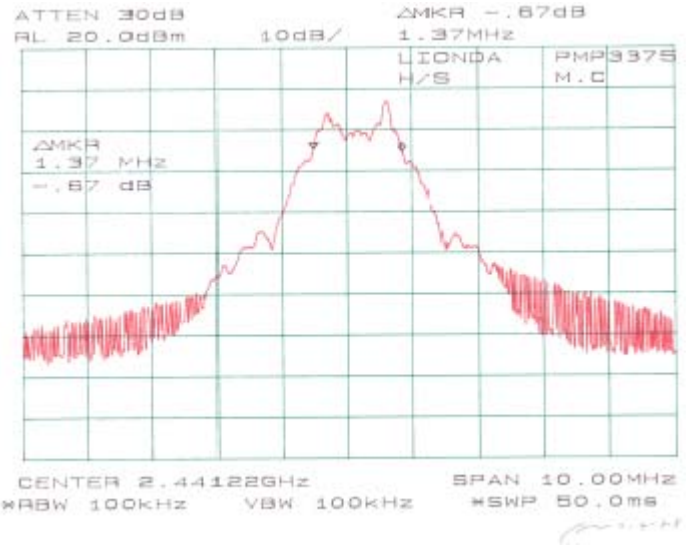
| Channel | Frequency (MHz) | Measured (MHz) | Measured (kHz) | Standard (kHz) | Result |
|---|---|---|---|---|---|
| Low | 2402.30 | 1.37 | 1370 | ≥ 500 | Pass |
| Mid | 2441.22 | 1.37 | 1370 | ≥ 500 | Pass |
| High | 2480.13 | 1.40 | 1400 | ≥ 500 | Pass |

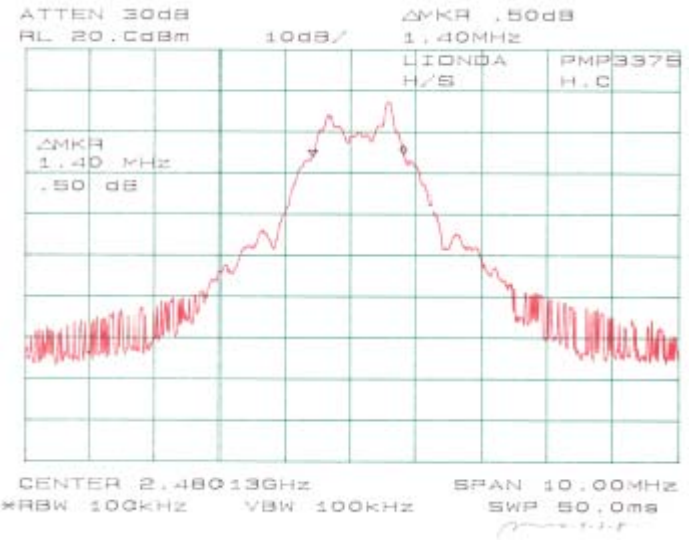

ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -.84dB
1.35MHz
LIONDA
BASE
PMP3375
L.C
ΔMKR
1.35 MHz
-.84 dB
CENTER 2.40230GHz
SPAN 10.00MHz
*RBW 10CkHz
VBW 100kHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -1.00dB
1.38MHz
LIONDA
BASE
PMP3375
M.C
ΔMKR
1.38 MHz
-1.00 dB
CENTER 2.44122GHz
SPAN 10.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -.16dB
1.38MHz
LIONDA
BASE
PMP3375
H.C
ΔMKR
1.38 MHz
-.16 dB
CENTER 2.48013GHz
SPAN 10.00MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -.67dB
1.37MHz
LIONDA
H/S
PMP3375
L.C
ΔMKR
1.37 MHz
-.67 dB
CENTER 2.402309GHz
SPAN 10.00MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -.67dB
1.37MHz
LIONDA
H/S
PMP3375
M.C
ΔMKR
1.37 MHz
-.67 dB
CENTER 2.441229GHz
SPAN 10.00MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR .50dB
1.40MHz
LIONDA
H/S
PMP3375
H.C
ΔMKR
1.40 MHz
.50 dB
CENTER 2.480139GHz
SPAN 10.00MHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

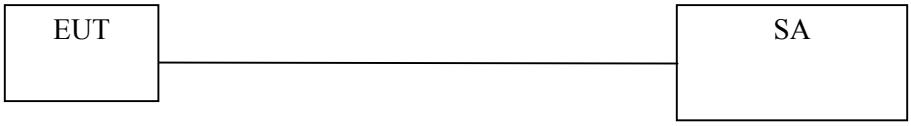
# §15.247(b)(3) - PEAK OUTPUT POWER MEASUREMENT

**Standard Applicable**

According to §15.247(b) (3), for systems using digital modulation in 2400-2483.5 MHz: 1 Watt

**Measurement Procedure**

1. Place the EUT on a bench 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 a spectrum analyzer.
3. Add a correction factor to the display.




**Equipment Lists**

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|---|---|---|---|---|
| HP | Analyzer, Spectrum | 8565EC | 3946A00131 | 2003-06-30 |

*** Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

**Measurement Result**

**Environmental Conditions**

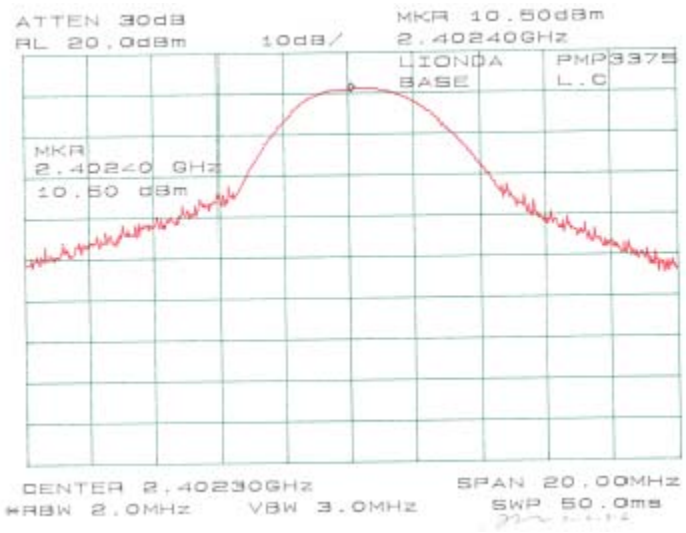
| | |
|---|---|
| Temperature: | 16° C |
| Relative Humidity: | 48% |
| ATM Pressure: | 1032 mbar |

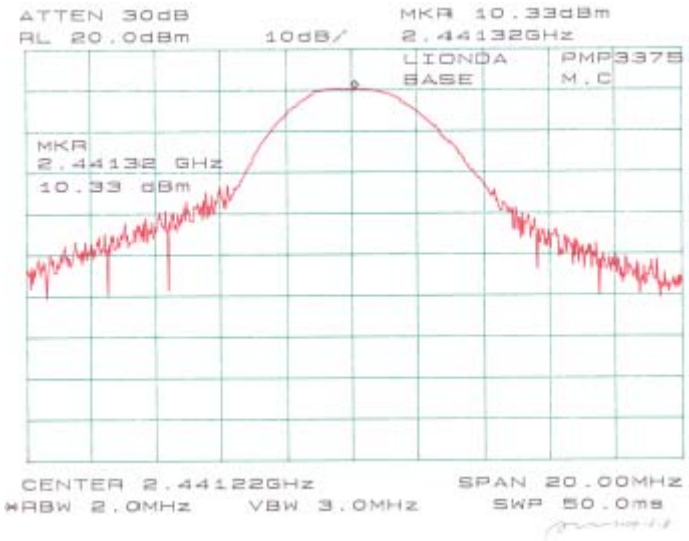
**Output Power for Base Unit**

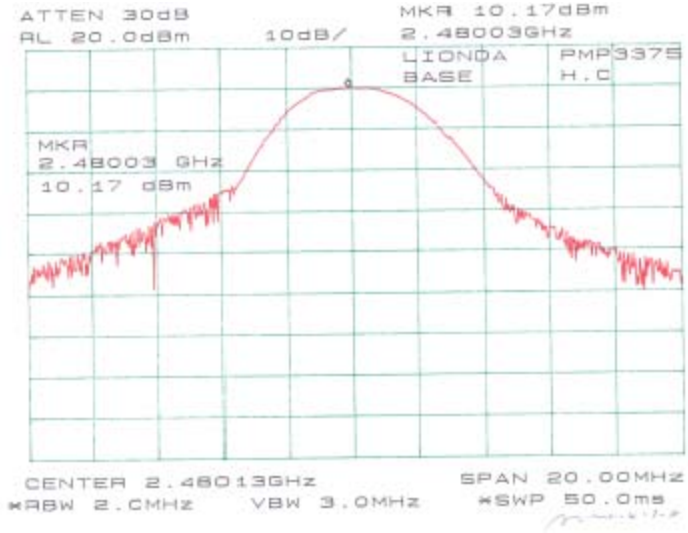
| Channel | Frequency (MHz) | RF Power (dBm) | RF Power (W) | Limit |
|---|---|---|---|---|
| Low (Ch1) | 2402.30 | 10.50 | 0.0112 | 1W (30dBm) |
| Mid (Ch7) | 2441.22 | 10.33 | 0.0108 | 1W (30dBm) |
| High (Ch11) | 2480.13 | 10.17 | 0.0104 | 1W (30dBm) |

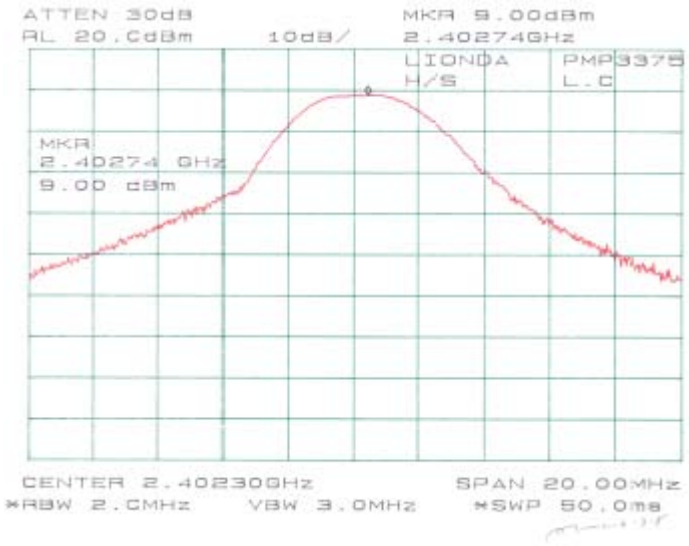
**Output Power for Handset Unit**

| Channel | Frequency (MHz) | RF Power (dBm) | RF Power (W) | Limit |
|---|---|---|---|---|
| Low (Ch1) | 2402.30 | 9.00 | 0.0080 | 1W (30dBm) |
| Mid (Ch7) | 2441.22 | 10.17 | 0.0104 | 1W (30dBm) |
| High (Ch11) | 2480.13 | 9.50 | 0.0089 | 1W (30dBm) |

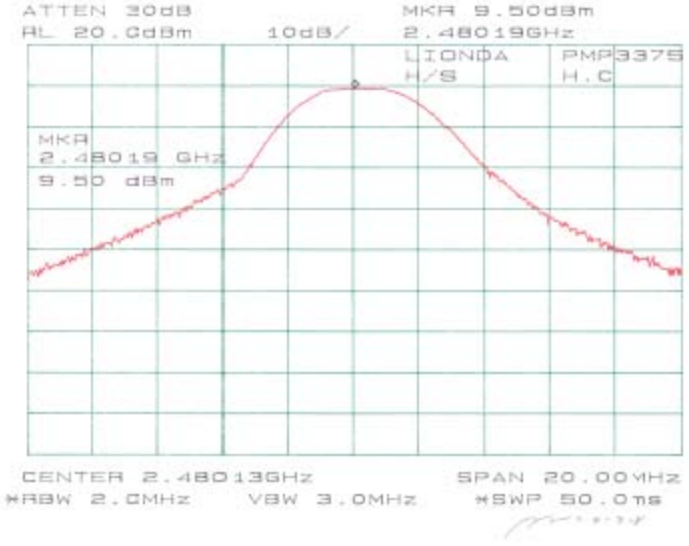

ATTEN 30dB
RL 20.0dBm
10dB/
MKR 10.50dBm
2.40240GHz
LIONDA
BASE
PMP3375
L.C
MKR
2.40240 GHz
10.50 dBm
CENTER 2.40230GHz
SPAN 20.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 10.33dBm
2.44132GHz
LIONDA
BASE
PMP3375
M.C
MKR
2.44132 GHz
10.33 dBm
CENTER 2.44122GHz
SPAN 20.00MHz
*RBW 2.0MHz
VBW 3.0MHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 10.17dBm
2.48003GHz
LIONDA
BASE
PMP3375
H.C
MKR
2.48003 GHz
10.17 dBm
CENTER 2.48013GHz
SPAN 20.00MHz
*RBW 2.0MHz
VBW 3.0MHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 9.00dBm
2.40274GHz
LIONDA
H/S
PMP3375
L.C
MKR
2.40274 GHz
9.00 dBm
CENTER 2.40230GHz
SPAN 20.00MHz
*RBW 2.0MHz
VBW 3.0MHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 10.17dBm
2.44125GHz
LIONDA
H/S
PMP3375
M.C
MKR
2.44125 GHz
10.17 dBm
CENTER 2.44122GHz
SPAN 20.00MHz
*RBW 2.0MHz
VBW 3.0MHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR 9.50dBm
2.48019GHz
LIONDA
H/S
PMP3375
H.C
MKR
2.48019 GHz
9.50 dBm
CENTER 2.48013GHz
SPAN 20.00MHz
*RBW 2.0MHz
VBW 3.0MHz
*SWP 50.0ms

# §15.247(c) - 100 KHZ BANDWIDTH OF BAND EDGES

**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)).

**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.

**Equipment Lists**

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|---|---|---|---|---|
| HP | Analyzer, Spectrum | 8565EC | 3946A00131 | 2003-06-30 |

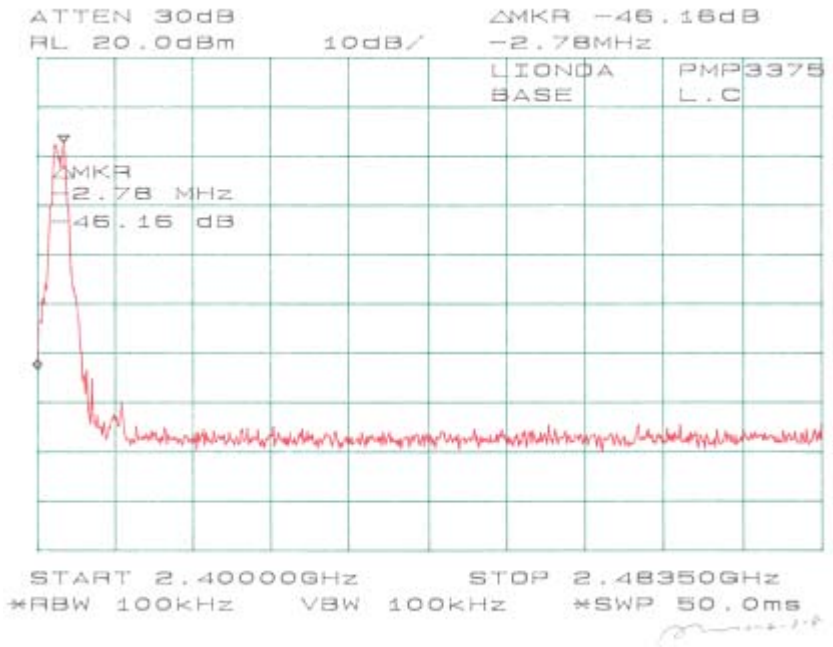
*** Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

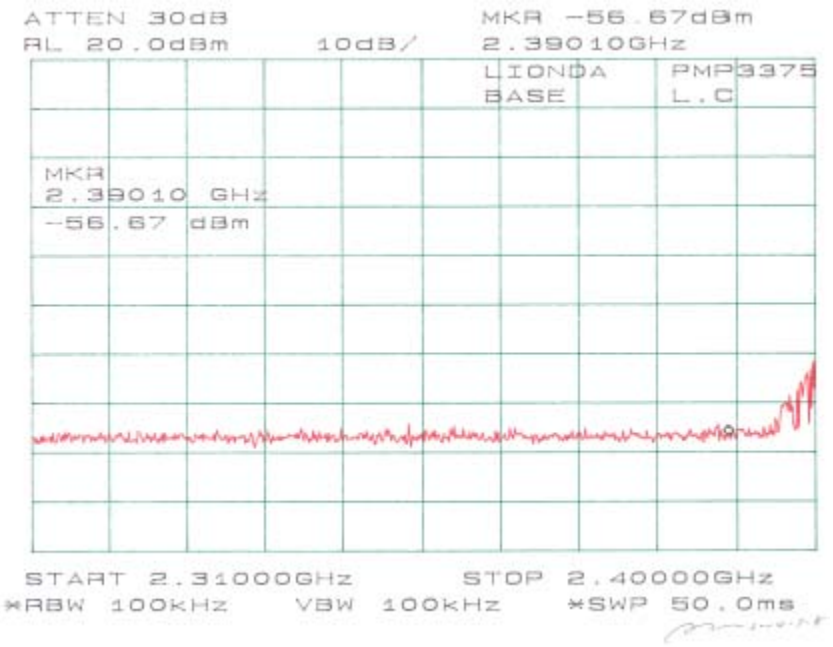
**Measure Results**

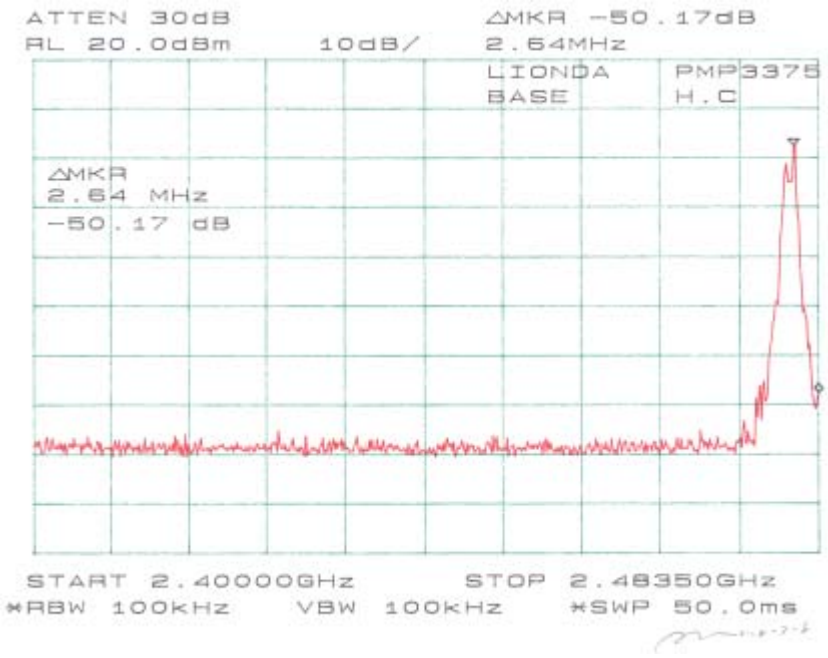
**Environmental Conditions**

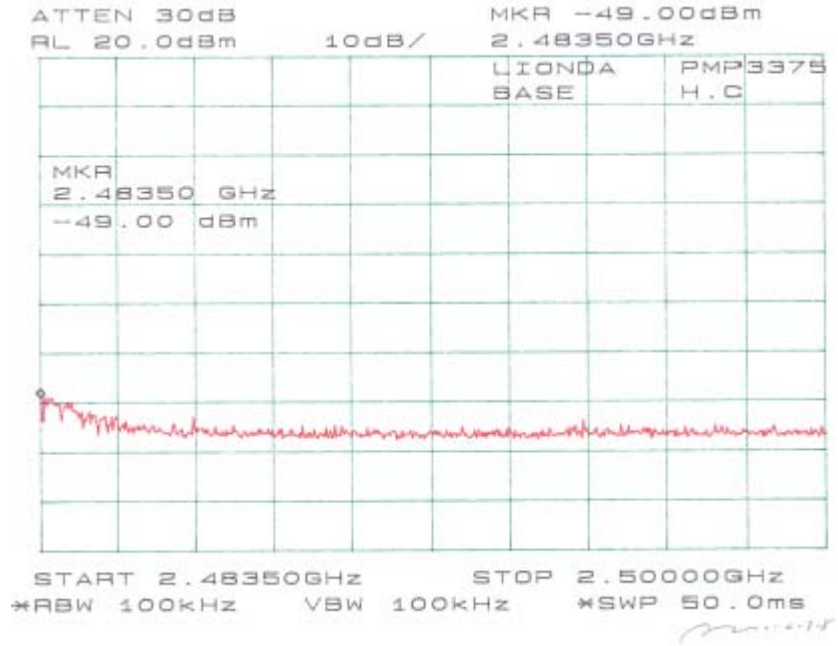
| | |
|---|---|
| Temperature: | 16° C |
| Relative Humidity: | 48% |
| ATM Pressure: | 1032 mbar |

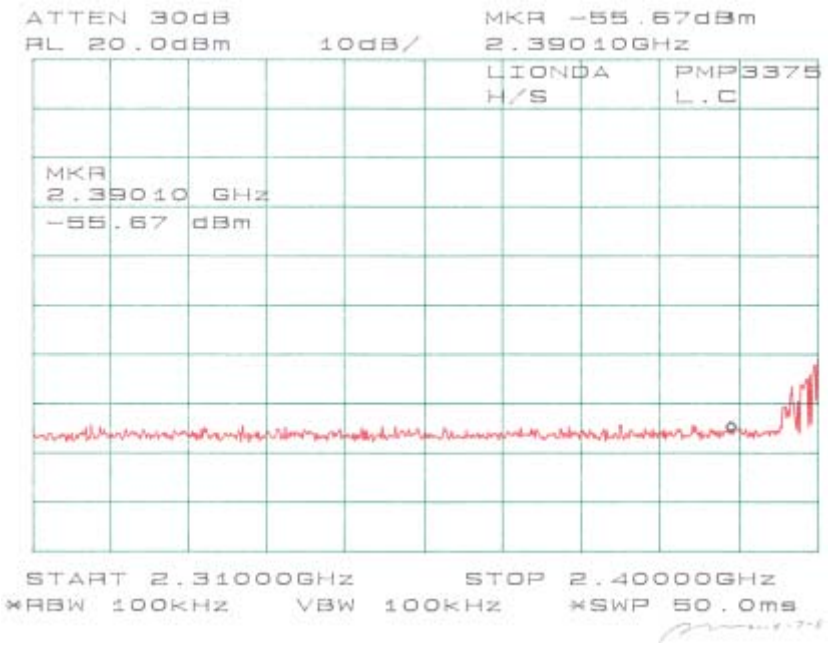
Please refer to following pages for plots of band edge.

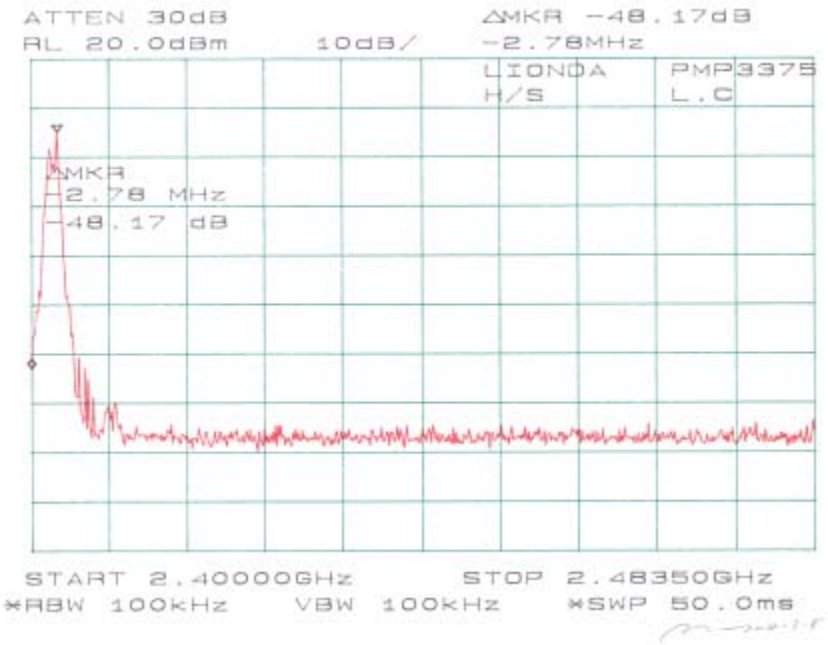

ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -46.16dB
-2.78MHz
LIONDA
BASE
PMP3375
L.C
ΔMKR
-2.78 MHz
-46.16 dB
START 2.40000GHz
STOP 2.48350GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms

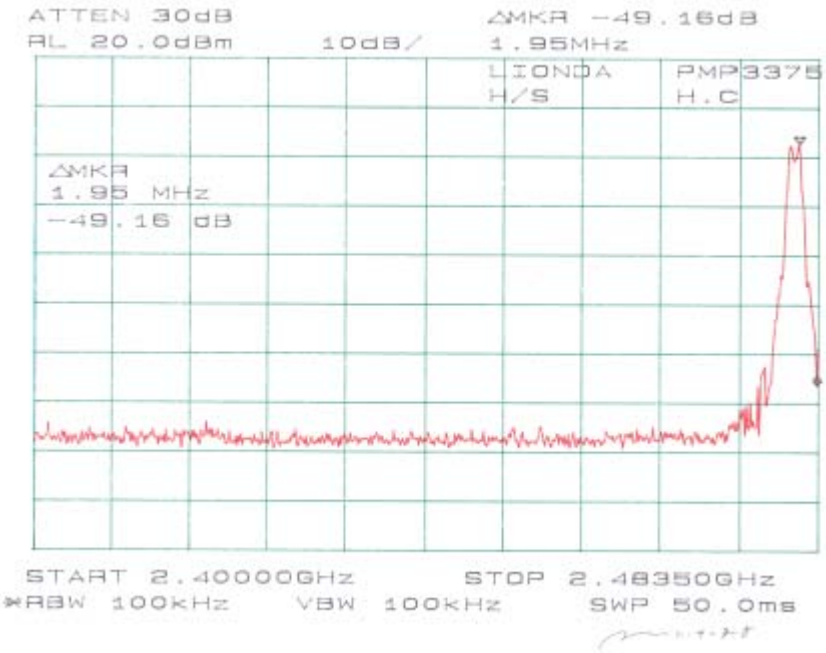

ATTEN 30dB
RL 20.0dBm
10dB/
MKR -56.67dBm
2.39010GHz
LIONDA
BASE
PMP3375
L.C
MKR
2.39010 GHz
-56.67 dBm
START 2.31000GHz
STOP 2.40000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms

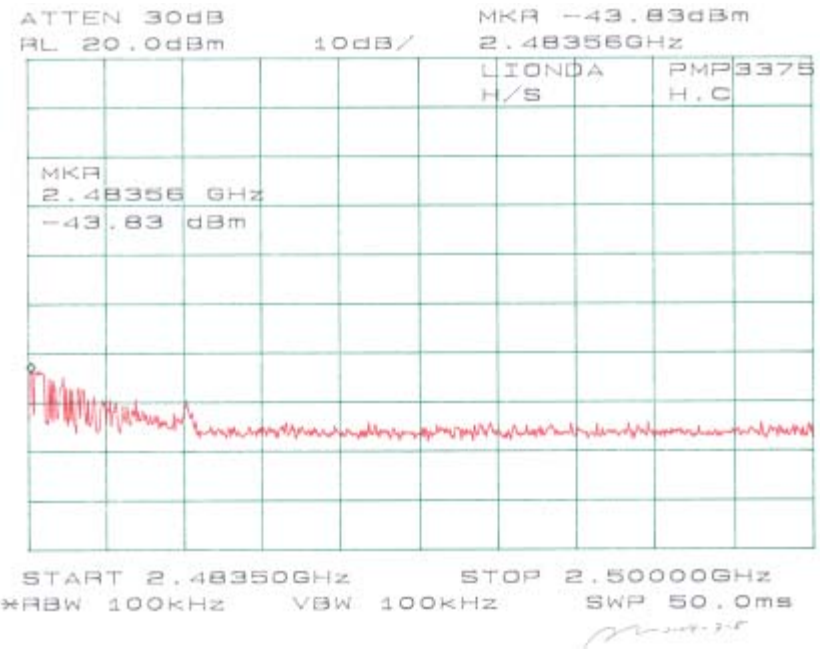

ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -50.17dB
2.64MHz
LIONDA
BASE
PMP3375
H.C
ΔMKR
2.64 MHz
-50.17 dB
START 2.40000GHz
STOP 2.48350GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -49.00dBm
2.48350GHz
LIONDA
BASE
PMP3375
H.C
MKR
2.48350 GHz
-49.00 dBm
START 2.48350GHz
STOP 2.50000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -55.67dBm
2.39010GHz
LIONDA
H/S
PMP3375
L.C
MKR
2.39010 GHz
-55.67 dBm
START 2.31000GHz
STOP 2.40000GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -48.17dB
-2.78MHz
LIONDA
H/S
PMP3375
L.C
ΔMKR
-2.78 MHz
-48.17 dB
START 2.40000GHz
STOP 2.48350GHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
ΔMKR -49.16dB
1.95MHz
LIONDA
H/S
PMP3375
H.C
ΔMKR
1.95 MHz
-49.16 dB
START 2.40000GHz
STOP 2.48350GHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms


ATTEN 30dB
RL 20.0dBm
10dB/
MKR -43.83dBm
2.48356GHz
LIONDA
H/S
PMP3375
H.C
MKR
2.48356 GHz
-43.83 dBm
START 2.48350GHz
STOP 2.50000GHz
*RBW 100kHz
VBW 100kHz
SWP 50.0ms

# §15.247(d) - POWER SPECTRAL DENSITY

**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.

**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. (DTS)
4. Repeat above procedures until all frequencies measured were complete.

**Equipment Lists**

| Manufacturer | Description | Model | Serial Number | Cal. Date |
|---|---|---|---|---|
| HP | Analyzer, Spectrum | 8565EC | 3946A00131 | 2003-06-30 |

*** Statement of Traceability: BACL Corp.** certifies that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Measurement Results

### Environmental Conditions

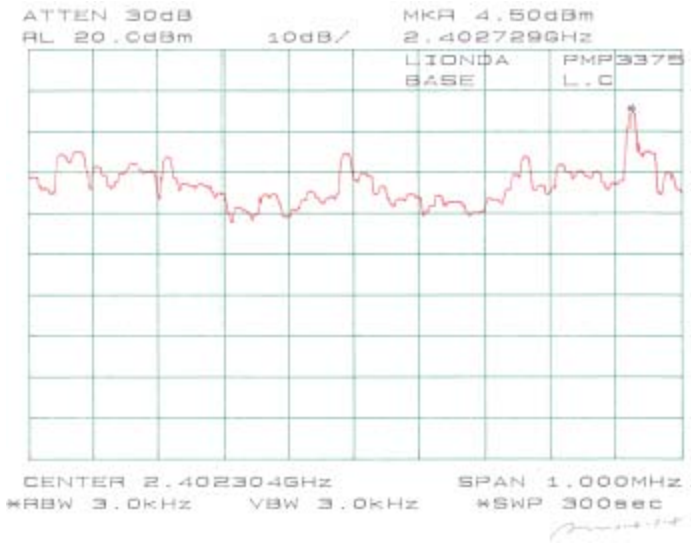
| | |
|---|---|
| Temperature: | 16° C |
| Relative Humidity: | 48% |
| ATM Pressure: | 1032 mbar |

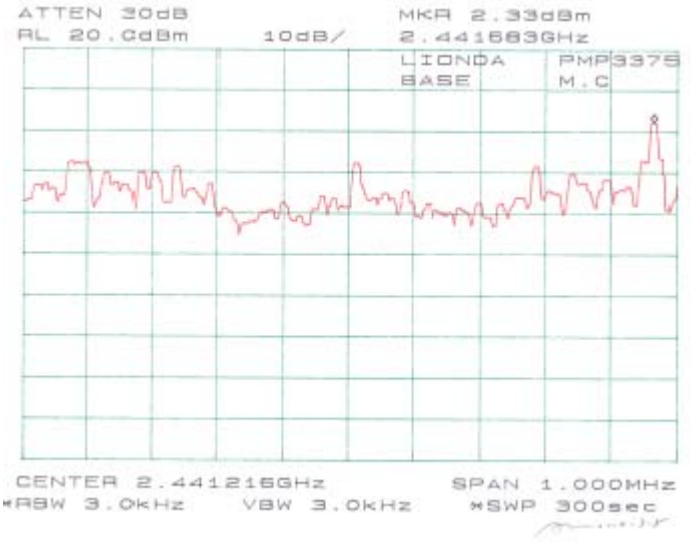
### Test Result for Base Unit

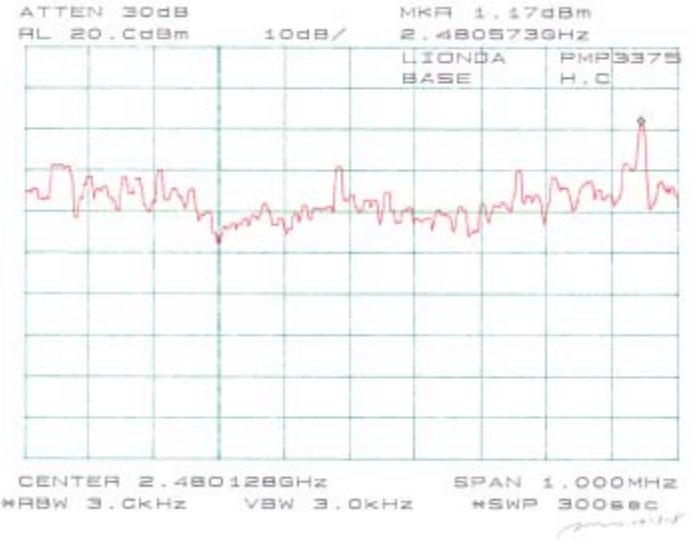
| Channel | Frequency (MHz) | Peak Power Spectral Density (dBm) | Standard (dBm) | Result |
|---|---|---|---|---|
| Low | 2402.30 | 4.50 | ≤ 8 | Pass |
| Mid | 2441.22 | 2.33 | ≤ 8 | Pass |
| High | 2480.13 | 1.17 | ≤ 8 | Pass |

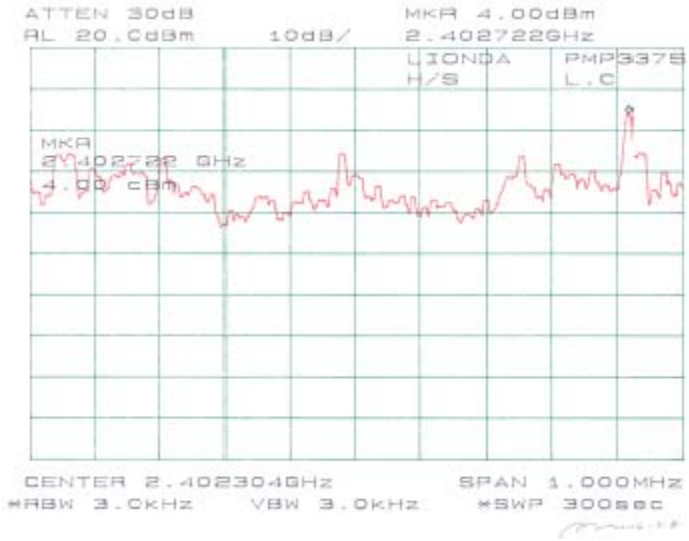
### Test Result for Handset Unit

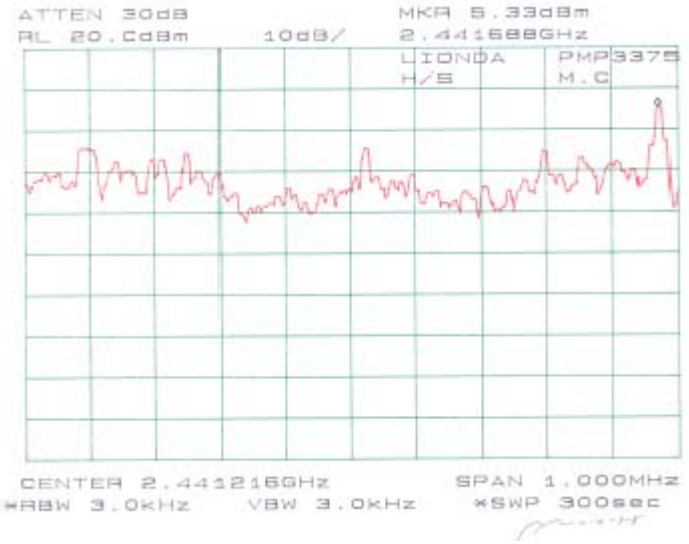
| Channel | Frequency (MHz) | Peak Power Spectral Density (dBm) | Standard (dBm) | Result |
|---|---|---|---|---|
| Low | 2402.30 | 4.00 | ≤ 8 | Pass |
| Mid | 2441.22 | 5.33 | ≤ 8 | Pass |
| High | 2480.13 | 5.50 | ≤ 8 | Pass |

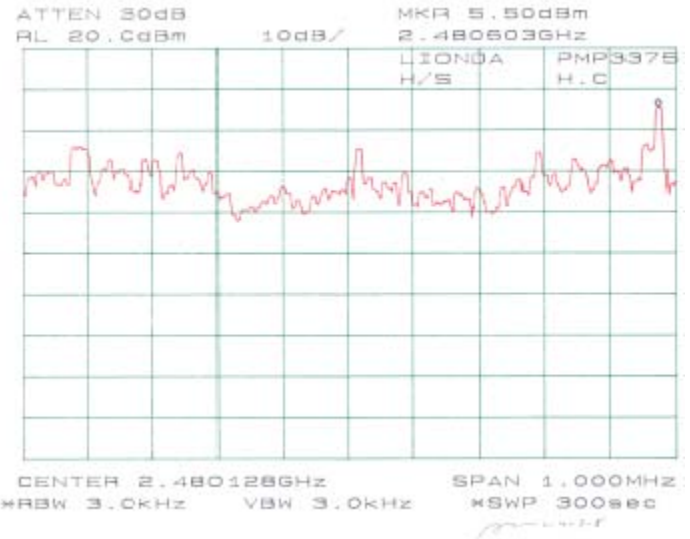

ATTEN 30dB
RL 20.CdBm
10dB/
MKR 4.50dBm
2.402729GHz
LIONDA
BASE
PMP3375
L.C
CENTER 2.402304GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 300sec


ATTEN 30dB
RL 20.CdBm
10dB/
MKR 2.33dBm
2.441683GHz
LIONDA
BASE
PMP3375
M.C
CENTER 2.441216GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 300sec


ATTEN 30dB
RL 20.CdBm
10dB/
MKR 1.17dBm
2.480573GHz
LIONDA
BASE
PMP3375
H.C
CENTER 2.480128GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 300sec


ATTEN 30dB
RL 20.CdBm
10dB/
MKR 4.00dBm
2.402722GHz
LIONDA
H/S
PMP3375
L.C
MKR
2.402722 GHz
4.00 dBm
CENTER 2.402304GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 300sec


ATTEN 30dB
RL 20.CdBm
10dB/
MKR 5.33dBm
2.441688GHz
LIONDA
H/S
PMP3375
M.C
CENTER 2.4412160GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 300sec


ATTEN 30dB
RL 20.CdBm
10dB/
MKR 5.50dBm
2.480503GHz
LIONDA
H/S
PMP3375
H.C
CENTER 2.480128GHz
SPAN 1.000MHz
*RBW 3.0kHz
VBW 3.0kHz
*SWP 300sec