# FCC PART 101

# TEST REPORT

For

## Lightpointe Communications, Inc.

11696 Sorento Valley Road, Ste. 101,

San Diego, CA 92121, USA

**FCC ID: PHVABG80PLUS**

| **Report Type:** | **Product Type:** |
|---|---|
| CIIPC Report | Wireless Point-to-Point Radio |

| | |
|---|---|
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| **Report Number:** | R1608172-101 |
| **Report Date:** | 2016-10-31 |
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* This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "*"

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## DOCUMENT REVISION HISTORY

| Revision Number | Report Number | Description of Revision | Date of Revision |
|---|---|---|---|
| 0 | R1608172-101 | Original Report | 2016-10-11 |
| 1 | R1608172-101 | Adding EIRP | 2016-10-31 |

# 1 General Description

## 1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of Lightpointe Communications, Inc., and their product FCC ID: PHVABG80PLUS, models: SAX1-1250-93X-S3S and SAX1-1250-93E-S3S which will henceforth be referred to as the EUT (Equipment Under Test). The EUT is a point-to-point 70/80 GHz radio system for full duplex transfer of data at up to Gigabit Ethernet rates. The models can be DC with AC adapter or Power over Ethernet.

## 1.2 Mechanical Description of EUT

The EUT measures approximately *22cm (L) x 22cm (W) x 12cm (H)*, and weighs approximately *5 k*g.

The Antenna measures approximately *100cm (L) x 100cm (W) x 28cm (H)*, and weighs approximately *11 k*g.

*The test data gathered are from typical production sample provided by Lightpointe Communications, Inc. Serial number R1608172-1 assigned by BACL Sunnyvale.*

Please refers to DOS for the detail explanations about other models.
Testing was performed at LAX1-1250-91E-S3S for 72GHz, LAX1-1250-92E-S3S for 82GHz, LAX1-1250-91X-S3S for 74GHz and LAX1-1250-92X-S3S for 84GHz.

## 1.3 Objective

This report is prepared on behalf of *Lightpointe Communications, Inc.* in accordance with Part 2, Subpart J, and Part 101, Subpart Q of the Federal Communication Commissions rules.

The objective is to determine C2PC compliance with FCC Part 101 rules for RF Output Power, field strength of spurious radiation and RF Exposure based on a new 3 Ft antenna.

## 1.4 Related Submittal(s)/Grant(s)

N/A

## 1.5 Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the Following parts:

Part 101-Subpart Q Service and Technical Rules for the 70/80/90 GHz Bands

Applicable Standards: TIA603-D.

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 or 1 meters.

## 1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the 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 CISPR16-4-2:2011, The Treatment of Uncertainty in EMC Measurements, the values ranging from ±2.0 dB for Conducted Emissions tests and ±4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BACL Corp.

## 1.7 Test Facility Registrations

BACLs test facilities that are used to perform Radiated and Conducted Emissions tests are currently recognized by the Federal Communications Commission as Accredited with NIST Designation Number US1129.

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Industry Canada under Registration Numbers: 3062A-1, 3062A-2, and 3062A-3.

BACL is a Chinese Taipei Bureau of Standards Metrology and Inspection (BSMI) validated Conformity Assessment Body (CAB), under Appendix B, Phase I Procedures of the APEC Mutual Recognition Arrangement (MRA). BACL's BSMI Lab Code Number is: SL2-IN-E-1002R

BACL's test facilities that are used to perform AC Line Conducted Emissions, Telecommunications Line Conducted Emissions, Radiated Emissions from 30 MHz to 1 GHz, and Radiated Emissions from 1 GHz to 6 GHz are currently recognized as Accredited in accordance with the Voluntary Control Council for Interference [VCCI] Article 15 procedures under Registration Number A-0027.

## 1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

**A-** ***An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3279.02),*** in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report..

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices, Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

**B-** ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3279.03)*** to certify

- For the USA (Federal Communications Commission):
  - 1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
  - 2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
  - 3- All Telephone Terminal Equipment within FCC Scope C.
- For the Canada (Industry Canada):
  - 1 All Scope 1-Licence-Exempt Radio Frequency Devices;
  - 2 All Scope 2-Licensed Personal Mobile Radio Services;
  - 3 All Scope 3-Licensed General Mobile & Fixed Radio Services;
  - 4 All Scope 4-Licensed Maritime & Aviation Radio Services;
  - 5 All Scope 5-Licensed Fixed Microwave Radio Services
  - 6 All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.
- For Singapore (Info-Communications Development Authority (IDA)):
  - 1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2
  - 2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA MRA Recognition Scheme: 2011, Annex 2
- For the Hong Kong Special Administrative Region:
  - 1 All Radio Equipment, per KHCA 10XX-series Specifications;
  - 2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
  - 3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.
- For Japan:
  - 1 MIC Telecommunication Business Law (Terminal Equipment):
    - All Scope A1 - Terminal Equipment for the Purpose of Calls;
    - All Scope A2 - Other Terminal Equipment
  - 2 Radio Law (Radio Equipment):
    - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
    - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
    - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

**C-** ***A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3279.01)*** to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

1 Electronics and Office Equipment:
- for Telephony (ver. 3.0)
- for Audio/Video (ver. 3.0)
- for Battery Charging Systems (ver. 1.1)
- for Set-top Boxes & Cable Boxes (ver. 4.1)
- for Televisions (ver. 6.1)
- for Computers (ver. 6.0)
- for Displays (ver. 6.0)
- for Imaging Equipment (ver. 2.0)
- for Computer Servers (ver. 2.0)

2 Commercial Food Service Equipment
- for Commercial Dishwashers (ver. 2.0)
- for Commercial Ice Machines (ver. 2.0)
- for Commercial Ovens (ver. 2.1)

- for Commercial Refrigerators and Freezers

3 Lighting Products
- For Decorative Light Strings (ver. 1.5)
- For Luminaires (including sub-components) and Lamps (ver. 1.2)
- For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
- For Integral LED Lamps (ver. 1.4)

4 Heating, Ventilation, and AC Products
- for Residential Ceiling Fans (ver. 3.0)
- for Residential Ventilating Fans (ver. 3.2)

5 Other
- For Water Coolers (ver. 3.0)

**D-** ***A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:***

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;
- Canada: (Industry Canada - IC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
  - BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
  - NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
  - Radio & Teleterminal Equipment (R&TTE) Directive 1995/5/EC
    US -EU EMC & Telecom MRA CAB
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA)
  APEC Tel MRA -Phase I & Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA -Phase I
- Singapore: (Infocomm Development Authority - IDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter-
- USA:
  - ENERGY STAR Recognized Test Laboratory – US EPA
  - Telecommunications Certification Body (TCB) – US FCC;
- Vietnam: APEC Tel MRA -Phase I;

# 2 System Test Configuration

## 2.1 Justification

The EUT was configured for testing according to TIA/EIA-603 D.

## 2.2 EUT Exercise Software

N/A, EUT is operating at normal mode.

## 2.3 Special Equipment

N/A

## 2.4 Equipment Modifications

No modifications were made to the EUT.

## 2.5 Local Support Equipment

N/A

## 2.6 EUT Internal Configuration Details

72 GHz Band

| Manufacturers | Descriptions | Models | Serial Numbers |
|---|---|---|---|
| LightPointe, Inc. | Main PCB | LP-CCIU-10A001 | 05160022 |
| LightPointe, Inc. | RF Module | - | S0831608116 |

82 GHz Band

| Manufacturers | Descriptions | Models | Serial Numbers |
|---|---|---|---|
| LightPointe, Inc. | Main PCB | LP-CCIU-10A001 | 05160048 |
| LightPointe, Inc. | RF Module | - | S0841608116 |

74 GHz Band

| Manufacturers | Descriptions | Models | Serial Numbers |
|---|---|---|---|
| LightPointe, Inc. | Main PCB | LP-CCIU-10A001 | 0515213 |
| LightPointe, Inc. | RF Module | - | S0731603119 |

84 GHz Band

| Manufacturers | Descriptions | Models | Serial Numbers |
|---|---|---|---|
| LightPointe, Inc. | Main PCB | LP-CCIU-10A001 | 0515206 |
| LightPointe, Inc. | RF Module | - | S0741603119 |

## 2.7 External I/O Cabling List and AC Cord

| Cable Description | Length (m) | From | To |
|---|---|---|---|
| RJ45 | >1 | EUT (MGMT Port) | POE |
| RJ45 | >1 | POE | Internet |
| RJ45 | >1 | EUT (Data Port) | Internet |
| Fiber cable | >1 | EUT | Media Converter |

## 2.8 Power Supply List and Details

| Manufacturer | Description | Model | Serial Number |
|---|---|---|---|
| Cincon Electronics Co., Ltd. | POE | TRG60A-POE-L | 046513 |

# 3 Summary of Test Results

Results reported relate only to the product tested.

| FCC Rules | Description of Test | Results |
|---|---|---|
| §101.1525, §2.1091 | RF Exposure | Compliant |
| §101.113, §2.1046 | RF Output Power (EIRP) | Compliant |
| §101.141, §2.1047 | Modulation Characteristics | N/A[1] |
| §101.109, §2.1049 | Occupied Bandwidth | N/A[2] |
| §101.111, §2.1053 | Field Strength of Spurious Radiation | Compliant |
| §101.107, §2.1055 | Frequency stability vs. temperature<br>Frequency stability vs. voltage | N/A[3] |

*Note 1: As per FCC §2.1047 (d) and FCC §101.141, there is no requirement for transmitters operating at 70 and 80 GHz*
*Note 2: testing items are not required for CIIPC application.*
*Note 3: Frequency Stability is not required for the frequencies of this EUT*

# 4 FCC §101.1525 & §2.1091 – RF Exposure

## 4.1 Applicable Standard

According to FCC §1.1307 (b) (1) and §101.1525, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for General Population/Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density ($mW/cm^2$) | Averaging Time (minutes) |
|---|---|---|---|---|
| Limits for General Population/Uncontrolled Exposure | | | | |
| 0.3-1.34 | 614 | 1.63 | * (100) | 30 |
| 1.34-30 | 824/f | 2.19/f | * ($180/f^2$) | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | / | / | f/1500 | 30 |
| 1500-100,000 | / | / | 1.0 | 30 |

f = frequency in MHz
* = Plane-wave equivalent power density

## 4.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density
P = power input to antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

## 4.3 MPE Results

**72 GHz band:**

| | |
|---|---|
| Maximum peak output power at antenna input terminal (dBm): | 20.64 |
| Maximum peak output power at antenna input terminal (mW): | 115.8777 |
| Prediction distance (cm): | 1522 |
| Prediction frequency (MHz): | 72,375 |
| Maximum Antenna Gain, typical (dBi): | 54 |
| Maximum Antenna Gain (numeric): | 251188.6 |
| Power density of prediction frequency at 20 cm ($mW/cm^2$): | 0.99991 |
| MPE limit for uncontrolled exposure at prediction frequency ($mW/cm^2$): | 1.0 |

**82 GHz band:**

| | |
|---|---|
| Maximum peak output power at antenna input terminal (dBm): | 20.46 |
| Maximum peak output power at antenna input terminal (mW): | 111.17 |
| Prediction distance (cm): | 1522 |
| Prediction frequency (MHz): | 82,375 |
| Maximum Antenna Gain, typical (dBi): | 54 |
| Maximum Antenna Gain (numeric): | 251188.6 |
| Power density of prediction frequency at 20 cm ($mW/cm^2$): | 0.959314 |
| MPE limit for uncontrolled exposure at prediction frequency ($mW/cm^2$): | 1.0 |

**74 GHz band:**

| | |
|---|---|
| Maximum peak output power at antenna input terminal (dBm): | 20.97 |
| Maximum peak output power at antenna input terminal (mW): | 125.026 |
| Prediction distance (cm): | 1581 |
| Prediction frequency (MHz): | 74,875 |
| Maximum Antenna Gain, typical (dBi): | 54 |
| Maximum Antenna Gain (numeric): | 251188.6 |
| Power density of prediction frequency at 20 cm ($mW/cm^2$): | 0.99983 |
| MPE limit for uncontrolled exposure at prediction frequency ($mW/cm^2$): | 1.0 |

**84 GHz band:**

| | |
|---|---|
| Maximum peak output power at antenna input terminal (dBm): | 20.59 |
| Maximum peak output power at antenna input terminal (mW): | 114.551 |
| Prediction distance (cm): | 1581 |
| Prediction frequency (MHz): | 84,875 |
| Maximum Antenna Gain, typical (dBi): | 54 |
| Maximum Antenna Gain (numeric): | 251188.6 |
| Power density of prediction frequency at 20 cm ($mW/cm^2$): | 0.916065 |
| MPE limit for uncontrolled exposure at prediction frequency ($mW/cm^2$): | 1.0 |

**72/82 GHz Band:**

The worst power density level at 1522 cm is 0.99991 $mW/cm^2$ antenna, which is below the uncontrolled exposure limit of 1.0 $mW/cm^2$.

**74/84 GHz Band:**

The worst power density level at 1581 cm is 0.99983 $mW/cm^2$ antenna, which is below the uncontrolled exposure limit of 1.0 $mW/cm^2$.

*Note: The conducted output power was performed by the manufacturer.*

# 5 FCC §2.1046 & §101.113 – RF Output Power

## 5.1 Applicable Standards

FCC §2.1046 and §101.113.

## 5.2 Test Procedure

EIRP (dBm) = Rated Conducted Output Power (dBm) + Antenna Gain (dBi)

Limit (dBm) = Limit (dBW)+30

## 5.3 Test Results

| Frequency Band | Rated Conducted Output Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|---|
| 72/82 GHz | 23 | 54 | 77 | 85 | Compliant |
| 74/84 GHz | 23 | 54 | 77 | 85 | Compliant |

# 6 FCC §2.1053 & §101.111 – Field Strength of Spurious Radiation

## 6.1 Applicable Standards

Requirements: FCC §2.1053 and §101.111 (2) (iii)

For operating frequencies above 15 GHz, In any 1 MHz band, the center frequency of which is removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 + 10 $Log_{10}$ (the mean output power in watts) decibels, or 80 decibels, whichever is the lesser attenuation. The authorized bandwidth includes the nominal radio frequency bandwidth of an individual transmitter/modulator in block-assigned bands. Equipment licensed prior to April 1, 2005 shall only be required to meet this standard in any 4 kHz band.

**72/82 GHz Bands:**

The maximum EIRP power (21 + 54 = 75 dBm) decrease 80dBc, so limit is -5dBm

**74/84 GHz Bands:**

The maximum EIRP power (21 + 54 = 75 dBm) decrease 80dBc, so limit is -5dBm

## 6.2 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into antenna which was also placed on the turntable.

The measurements antenna was placed at a distance of 1 or 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to 200 GHz.

## 6.3 Test Equipment List and Details

| Manufacturer | Description | Model No. | Serial No. | Calibration Due |
|---|---|---|---|---|
| OML | Diplexer for Agilent Spectrum Analyzer | DPL.26 | N/A | N/A[1] |
| OML | WR-12 Harmonic Mixer with Horn Antenna | M12HWD | 130529-1 | N/A[1] |
| OML | WR19 Harmonic Mixer with Horn Antenna | M19HWD | U60313-1 | N/A[1] |
| OML | WR08 Harmonic Mixer with Horn Antenna | M08HWD | F60313-1 | N/A[1] |
| OML | G Band Harmonic Mixer with Horn Antenna | M05HWD | G60106-1 | N/A[1] |
| Wisewave | Horn Antenna | ARH-4223-02 | 10555-02 | 2016-09-20 |
| Wisewave | Horn Antenna | ARH-2823-02 | 10555-01 | 2016-09-20 |
| Sunol Sciences Corp | Horn Antenna | DRH-118 | A052704 | 2017-03-09 |
| Wisewave | Amplifier, Low Noise | ALN-33144030-01 | 11424-01 | 2017-05-16 |
| Hewlett | Pre-Amplifier | 8449B | 3008A01978 | 2017-05-22 |
| Hewlett & Packard | Amplifier, Pre | 8447D | 2944A10187 | 2017-03-08 |
| Agilent | Analyzer, Spectrum | E4446A | MY48250238 | 2015-10-22 |
| Sunol Science Corp | System Controller | SC99V | 011003-1 | N/R |
| Sunol Sciences | Antenna, Biconi-Log | JB3 | A020106-2 | 2016-07-11 |
| Agilent | Analyzer, Spectrum | E4446A | MY48250238 | 2016-10-22 |
| Rohde & Schwarz | EMI Test Receiver | ESCI 1166.5950K03 | 100044 | 2017-06-24 |

**Note 1.** Verification was performed at system level and not at the individual component level

**Statement of Traceability: BACL** attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.

## 6.4 Test Environmental Conditions

| | |
|---|---|
| **Temperature:** | 27° C |
| **Relative Humidity:** | 45 % |
| **ATM Pressure:** | 102.2 kPa |

*The testing was performed by Jin Yang on 2015-09-15~16 at 5m chamber 3*

## 6.5 Test Results

72/82 GHz Band Low

| Freq. (MHz) | S.A. Amp. (dBµV) | Table Azimuth (Degrees) | Test Antenna | | Substitution | | | | Absolute Level (dBm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polar (H/V) | Freq. (MHz) | S.G. Level (dBm) | Antenna Gain (dB) | Cable Loss (dB) | | Limit (dBm) | Margin (dB) |
| 1860 | 55.33 | 0 | 150 | H | 1860 | -39.67 | 8.372 | 0.86 | -32.158 | -5 | -27.158 |
| 1860 | 54.77 | 0 | 150 | V | 1860 | -40.23 | 8.372 | 0.86 | -32.718 | -5 | -27.718 |
| 6300 | 58.51 | 180 | 150 | H | 6300 | -24.49 | 11.643 | 1.45 | -14.297 | -5 | -9.297 |
| 6300 | 60.09 | 180 | 150 | V | 6300 | -22.91 | 11.643 | 1.45 | -12.717 | -5 | -7.717 |
| 37310 | 57.7 | 0 | 150 | H | 37310 | -12.3 | 4.809 | 3.33 | -10.821 | -5 | -5.821 |
| 37310 | 57.65 | 0 | 150 | V | 37310 | -12.35 | 4.809 | 3.33 | -10.871 | -5 | -5.871 |
| 44.6 | 67.19 | 0 | 150 | H | 44.6 | -42.81 | 0 | 0.1 | -42.91 | -5 | -37.91 |
| 68.8 | 54.88 | 0 | 150 | V | 68.8 | -55.12 | 0 | 0.1 | -55.22 | -5 | -50.22 |

72/82 GHz Band High

| Freq. (MHz) | S.A. Amp. (dBµV) | Table Azimuth (Degrees) | Test Antenna | | Substitution | | | | Absolute Level (dBm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polar (H/V) | Freq. (MHz) | S.G. Level (dBm) | Antenna Gain (dB) | Cable Loss (dB) | | Limit (dBm) | Margin (dB) |
| 1875 | 61.83 | 0 | 150 | H | 1875 | -33.17 | 8.372 | 0.86 | -25.658 | -5 | -20.658 |
| 1875 | 64.05 | 0 | 150 | V | 1875 | -30.95 | 8.372 | 0.86 | -23.438 | -5 | -18.438 |
| 3700 | 59.2 | 180 | 150 | H | 3700 | -26.8 | 9.69 | 1.45 | -18.56 | -5 | -13.56 |
| 3700 | 66.6 | 180 | 150 | V | 3700 | -19.4 | 9.69 | 1.45 | -11.16 | -5 | -6.16 |
| 37150 | 57.7 | 0 | 150 | H | 37150 | -12.3 | 4.809 | 3.33 | -10.821 | -5 | -5.821 |
| 37190 | 58.19 | 0 | 150 | V | 37190 | -11.81 | 4.809 | 3.33 | -10.331 | -5 | -5.331 |
| 44.6 | 68.23 | 0 | 150 | H | 44.6 | -41.77 | 0 | 0.1 | -41.87 | -5 | -36.87 |
| 68.8 | 55.15 | 0 | 150 | V | 68.8 | -54.85 | 0 | 0.1 | -54.95 | -5 | -49.95 |

74/84 GHz Band Low

| Freq. (MHz) | S.A. Amp. (dBµV) | Table Azimuth (Degrees) | Test Antenna | | Substitution | | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polar (H/V) | Freq. (MHz) | S.G. Level (dBm) | Antenna Gain (dB) | Cable Loss (dB) | | | |
| 1863 | 60.36 | 0 | 150 | H | 1863 | -34.64 | 8.372 | 0.86 | -27.128 | -5 | -22.128 |
| 1877 | 63.24 | 0 | 150 | V | 1877 | -31.76 | 8.372 | 0.86 | -24.248 | -5 | -19.248 |
| 3700 | 56.18 | 180 | 150 | H | 3700 | -29.82 | 9.69 | 1.45 | -21.58 | -5 | -16.58 |
| 3700 | 58.63 | 180 | 150 | V | 3700 | -27.37 | 9.69 | 1.45 | -19.13 | -5 | -14.13 |
| 37310 | 57.7 | 0 | 150 | H | 37310 | -12.3 | 4.809 | 3.33 | -10.821 | -5 | -5.821 |
| 37200 | 58.02 | 0 | 150 | V | 37200 | -11.98 | 4.809 | 3.33 | -10.501 | -5 | -5.501 |
| 45 | 67.94 | 0 | 150 | H | 45 | -42.06 | 0 | 0.1 | -42.16 | -5 | -37.16 |
| 68.9 | 55.23 | 0 | 150 | V | 68.9 | -54.77 | 0 | 0.1 | -54.87 | -5 | -49.87 |

74/84 GHz Band High

| Freq. (MHz) | S.A. Amp. (dBµV) | Table Azimuth (Degrees) | Test Antenna | | Substitution | | | | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Height (cm) | Polar (H/V) | Freq. (MHz) | S.G. Level (dBm) | Antenna Gain (dB) | Cable Loss (dB) | | | |
| 1877 | 63.1 | 0 | 150 | H | 1877 | -31.9 | 8.372 | 0.86 | -24.388 | -5 | -19.388 |
| 1880 | 64.35 | 0 | 150 | V | 1880 | -30.65 | 8.372 | 0.86 | -23.138 | -5 | -18.138 |
| 6300 | 54.37 | 180 | 150 | H | 6300 | -28.63 | 11.643 | 1.45 | -18.437 | -5 | -13.437 |
| 6300 | 55.89 | 180 | 150 | V | 6300 | -27.11 | 11.643 | 1.45 | -16.917 | -5 | -11.917 |
| 43430 | 57.98 | 0 | 150 | H | 43430 | -12.02 | 4.809 | 3.33 | -10.541 | -5 | -5.541 |
| 37430 | 57.52 | 0 | 150 | V | 37430 | -12.48 | 4.809 | 3.33 | -11.001 | -5 | -6.001 |
| 45 | 69.47 | 0 | 150 | V | 45 | -40.53 | 0 | 0.1 | -40.63 | -5 | -35.63 |
| 69.58 | 56.88 | 0 | 150 | H | 69.58 | -53.12 | 0 | 0.1 | -53.22 | -5 | -48.22 |

***Note:*** *All other emissions are at the noise floor and/or more than 20 dB below the limit.*