# Test Report

| | |
|---|---|
| **Applicant:** | Astera LED-Technology GmbH |
| **Address of Applicant:** | Stahlgruberring 36, 81829 Munich, Germany |
| **Manufacturer:** | Astera Manufacturing Limited |
| **Address of Manufacturer:** | Rm. 201, Huazhong Indutrial Park, No. 12 South Huancheng Road, Bantian Street, Longgang District, 518129 Shenzhen, China |

**Equipment Under Test (EUT)**

| | |
|---|---|
| Product Name: | Stage Luminaires |
| Model No.: | FP1, FP2 |
| Trade Mark: | ASTERA |
| **FCC ID:** | X55FP |
| **Applicable standards:** | FCC CFR Title 47 Part 15 Subpart C Section 15.247 |
| **Date of sample receipt:** | August 05, 2019 |
| **Date of Test:** | August 05-October 10, 2019 |
| **Date of report issued:** | December 12, 2019 |
| **Test Result :** | PASS * |

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

**Robinson Lo**
**Laboratory Manager**

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

## 2 Version

| Version No. | Date | Description |
|---|---|---|
| *00* | *December 12, 2019* | *Original* |
| | | |
| | | |
| | | |
| | | |

***Prepared By:*** ***Date:*** *December 12, 2019*

***Project Engineer***

***Check By:*** ***Date:*** *December 12, 2019*

***Reviewer***

# 3 Contents

Page

**1 COVER PAGE ..... 1**

**2 VERSION ..... 2**

**3 CONTENTS ..... 3**

**4 TEST SUMMARY ..... 4**

**5 GENERAL INFORMATION ..... 5**

5.1 GENERAL DESCRIPTION OF EUT ..... 5
5.2 TEST MODE ..... 7
5.3 DESCRIPTION OF SUPPORT UNITS ..... 7
5.4 DEVIATION FROM STANDARDS ..... 7
5.5 ABNORMALITIES FROM STANDARD CONDITIONS ..... 7
5.6 TEST FACILITY ..... 7
5.7 TEST LOCATION ..... 7

**6 TEST INSTRUMENTS LIST ..... 8**

**7 TEST RESULTS AND MEASUREMENT DATA ..... 10**

7.1 ANTENNA REQUIREMENT ..... 10
7.2 CONDUCTED EMISSIONS ..... 11
7.3 CONDUCTED PEAK OUTPUT POWER ..... 16
7.4 20DB EMISSION BANDWIDTH ..... 18
7.5 CARRIER FREQUENCIES SEPARATION ..... 20
7.6 HOPPING CHANNEL NUMBER ..... 22
7.7 DWELL TIME ..... 23
7.8 BAND EDGE ..... 27
*7.8.1 Conducted Emission Method ..... 错误！未定义书签。*
7.9 SPURIOUS EMISSION ..... 30
*7.9.1 Conducted Emission Method ..... 30*
*7.9.2 Radiated Emission Method ..... 34*

**8 TEST SETUP PHOTO ..... 73**

**9 EUT CONSTRUCTIONAL DETAILS ..... 74**

# 4 Test Summary

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| Antenna Requirement | 15.203 | Pass |
| AC Power Line Conducted Emission | 15.207 | Pass |
| Conducted Peak Output Power | 15.247 (b)(2) | Pass |
| 20dB Occupied Bandwidth | 15.247 (a)(1)(i) | Pass |
| Carrier Frequencies Separation | 15.247 (a)(1)(i) | Pass |
| Hopping Channel Number | 15.247 (a)(1)(i) | Pass |
| Dwell Time | 15.247 (a)(1)(i) | Pass |
| Pseudorandom Frequency Hopping Sequence | 15.247 (a)(1)(i) | Pass |
| Radiated Emission | 15.205/15.209 | Pass |
| Band Edge | 15.247(d) | Pass |

*Remarks:*

1. *Pass: The EUT complies with the essential requirements in the standard.*
2. *Test according to ANSI C63.10:2013*

**Measurement Uncertainty**

| Test Item | Frequency Range | Measurement Uncertainty | Notes |
|---|---|---|---|
| Radiated Emission | 30MHz-200MHz | 3.8039dB | (1) |
| Radiated Emission | 200MHz-1GHz | 3.9679dB | (1) |
| Radiated Emission | 1GHz-18GHz | 4.29dB | (1) |
| Radiated Emission | 18GHz-40GHz | 3.30dB | (1) |
| AC Power Line Conducted Emission | 0.15MHz ~ 30MHz | 3.44dB | (1) |
| Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%. | | | |

# 5 General Information

## 5.1 General Description of EUT

| | |
|---|---|
| Product Name: | Stage Luminaires |
| Model No.: | FP1, FP2 |
| Serial No.: | N/A |
| Test sample(s) ID: | GTS201912000096-1 |
| Sample(s) Status: | Engineer sample |
| Operation Frequency: | 917.00MHz~922.20MHz |
| Channel numbers: | 53 |
| Channel separation: | 0.1MHz |
| Modulation type: | GFSK |
| Antenna Type: | PIFA Antenna |
| Antenna gain: | 2.0dBi(Declare by applicant) |
| Power supply: | DC 14.4V<br>Adaptor: PS1065-240T2B250<br>Input: 100-240V~, 50-60Hz, 1.8A<br>Output: DC 24V, 2.5A, 60W Max |

| **Operation Frequency each of channel** | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
| **1** | **917.0MHz** | 16 | 918.5MHz | 31 | 920.0MHz | 46 | 921.5MHz |
| 2 | 917.1MHz | 17 | 918.6MHz | 32 | 920.1MHz | 47 | 921.6MHz |
| 3 | 917.2MHz | 18 | 918.7MHz | 33 | 920.2MHz | 48 | 921.7MHz |
| 4 | 917.3MHz | 19 | 918.8MHz | 34 | 920.3MHz | 49 | 921.8MHz |
| 5 | 917.4MHz | 20 | 918.9MHz | 35 | 920.4MHz | 50 | 921.9MHz |
| 6 | 917.5MHz | 21 | 919.0MHz | 36 | 920.5MHz | 51 | 922.0MHz |
| 7 | 917.6MHz | 22 | 919.1MHz | 37 | 920.6MHz | 52 | 922.1MHz |
| 8 | 917.7MHz | 23 | 919.2MHz | 38 | 920.7MHz | **53** | **922.2MHz** |
| 9 | 917.8MHz | 24 | 919.3MHz | 39 | 920.8MHz | | |
| 10 | 917.9MHz | 25 | 919.4MHz | 40 | 920.9MHz | | |
| 11 | 918.0MHz | 26 | 919.5MHz | 41 | 921.0MHz | | |
| 12 | 918.1MHz | **27** | **919.6MHz** | 42 | 921.1MHz | | |
| 13 | 918.2MHz | 28 | 919.7MHz | 43 | 921.2MHz | | |
| 14 | 918.3MHz | 29 | 919.8MHz | 44 | 921.3MHz | | |
| 15 | 918.4MHz | 30 | 919.9MHz | 45 | 921.4MHz | | |

Test CH

| Channel | Frequency |
|---|---|
| The lowest channel | 917.0MHz |
| The middle channel | 919.6MHz |
| The Highest channel | 922.2MHz |

## 5.2 Test mode

| | |
|---|---|
| Transmitting mode | Keep the EUT in continuously transmitting mode. |
| *Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.* | |

## 5.3 Description of Support Units

None.

## 5.4 Deviation from Standards

None.

## 5.5 Abnormalities from Standard Conditions

None.

## 5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383.

● **IC —Registration No.: 9079A**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A

● **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). LAB CODE:600179-0

## 5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

# 6 Test Instruments list

| Radiated Emission: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | 3m Semi- Anechoic Chamber | ZhongYu Electron | 9.2(L)*6.2(W)* 6.4(H) | GTS250 | July. 03 2015 | July. 02 2020 |
| 2 | Control Room | ZhongYu Electron | 6.2(L)*2.5(W)* 2.4(H) | GTS251 | N/A | N/A |
| 3 | EMI Test Receiver | Rohde & Schwarz | ESU26 | GTS203 | June. 26 2019 | June. 25 2020 |
| 4 | BiConiLog Antenna | SCHWARZBECK MESS-ELEKTRONIK | VULB9163 | GTS214 | June. 26 2019 | June. 25 2020 |
| 5 | Double -ridged waveguide horn | SCHWARZBECK MESS-ELEKTRONIK | BBHA 9120 D | GTS208 | June. 26 2019 | June. 25 2020 |
| 6 | Horn Antenna | ETS-LINDGREN | 3160 | GTS217 | June. 26 2019 | June. 25 2020 |
| 7 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 8 | Coaxial Cable | GTS | N/A | GTS213 | June. 26 2019 | June. 25 2020 |
| 9 | Coaxial Cable | GTS | N/A | GTS211 | June. 26 2019 | June. 25 2020 |
| 10 | Coaxial cable | GTS | N/A | GTS210 | June. 26 2019 | June. 25 2020 |
| 11 | Coaxial Cable | GTS | N/A | GTS212 | June. 26 2019 | June. 25 2020 |
| 12 | Amplifier(100kHz-3GHz) | HP | 8347A | GTS204 | June. 26 2019 | June. 25 2020 |
| 13 | Amplifier(2GHz-20GHz) | HP | 84722A | GTS206 | June. 26 2019 | June. 25 2020 |
| 14 | Amplifier (18-26GHz) | Rohde & Schwarz | AFS33-18002 650-30-8P-44 | GTS218 | June. 26 2019 | June. 25 2020 |
| 15 | Band filter | Amindeon | 82346 | GTS219 | June. 26 2019 | June. 25 2020 |
| 16 | Power Meter | Anritsu | ML2495A | GTS540 | June. 26 2019 | June. 25 2020 |
| 17 | Power Sensor | Anritsu | MA2411B | GTS541 | June. 26 2019 | June. 25 2020 |
| 18 | Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | GTS575 | June. 26 2019 | June. 25 2020 |
| 19 | Splitter | Agilent | 11636B | GTS237 | June. 26 2019 | June. 25 2020 |
| 20 | Loop Antenna | ZHINAN | ZN30900A | GTS534 | June. 26 2019 | June. 25 2020 |
| 21 | Breitband hornantenne | SCHWARZBECK | BBHA 9170 | GTS579 | Oct. 20 2018 | Oct. 19 2019 |
| 22 | Amplifier | TDK | PA-02-02 | GTS574 | Oct. 20 2018 | Oct. 19 2019 |
| 23 | Amplifier | TDK | PA-02-03 | GTS576 | Oct. 20 2018 | Oct. 19 2019 |
| 24 | PSA Series Spectrum Analyzer | Rohde & Schwarz | FSP | GTS578 | June. 26 2019 | June. 25 2020 |

| Conducted Emission | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | Shielding Room | ZhongYu Electron | 7.3(L)x3.1(W)x2.9(H) | GTS252 | May.15 2019 | May.14 2022 |
| 2 | EMI Test Receiver | R&S | ESCI 7 | GTS552 | June. 26 2019 | June. 25 2020 |
| 3 | Coaxial Switch | ANRITSU CORP | MP59B | GTS225 | June. 26 2019 | June. 25 2020 |
| 4 | Artificial Mains Network | SCHWARZBECK MESS | NSLK8127 | GTS226 | June. 26 2019 | June. 25 2020 |
| 5 | Coaxial Cable | GTS | N/A | GTS227 | N/A | N/A |
| 6 | EMI Test Software | AUDIX | E3 | N/A | N/A | N/A |
| 7 | Thermo meter | KTJ | TA328 | GTS233 | June. 26 2019 | June. 25 2020 |
| 8 | Absorbing clamp | Elektronik-Feinmechanik | MDS21 | GTS229 | June. 26 2019 | June. 25 2020 |
| 9 | ISN | SCHWARZBECK | NTFM 8158 | GTD565 | June. 26 2019 | June. 25 2020 |

| RF Conducted Test: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | MXA Signal Analyzer | Agilent | N9020A | GTS566 | June. 26 2019 | June. 25 2020 |
| 2 | EMI Test Receiver | R&S | ESCI 7 | GTS552 | June. 26 2019 | June. 25 2020 |
| 3 | Spectrum Analyzer | Agilent | E4440A | GTS533 | June. 26 2019 | June. 25 2020 |
| 4 | MXG vector Signal Generator | Agilent | N5182A | GTS567 | June. 26 2019 | June. 25 2020 |
| 5 | ESG Analog Signal Generator | Agilent | E4428C | GTS568 | June. 26 2019 | June. 25 2020 |
| 6 | USB RF Power Sensor | DARE | RPR3006W | GTS569 | June. 26 2019 | June. 25 2020 |
| 7 | RF Switch Box | Shongyi | RFSW3003328 | GTS571 | June. 26 2019 | June. 25 2020 |
| 8 | Programmable Constant Temp & Humi Test Chamber | WEWON | WHTH-150L-40-880 | GTS572 | June. 26 2019 | June. 25 2020 |

| General used equipment: | | | | | | |
|---|---|---|---|---|---|---|
| **Item** | **Test Equipment** | **Manufacturer** | **Model No.** | **Inventory No.** | **Cal.Date (mm-dd-yy)** | **Cal.Due date (mm-dd-yy)** |
| 1 | Humidity/ Temperature Indicator | KTJ | TA328 | GTS243 | June. 26 2019 | June. 25 2020 |
| 2 | Barometer | ChangChun | DYM3 | GTS255 | June. 26 2019 | June. 25 2020 |

# 7 Test results and Measurement Data

## 7.1 Antenna requirement

| Standard requirement: | FCC Part15 C Section 15.203 /247(c) |
|---|---|
| **15.203 requirement:**<br>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. | |

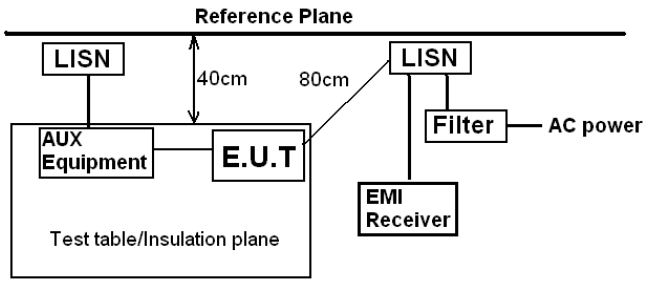
## 7.2 Conducted Emissions

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.207 |
| Test Method: | ANSI C63.10:2013 |
| Test Frequency Range: | 150KHz to 30MHz |
| Class / Severity: | Class B |
| Receiver setup: | RBW=9KHz, VBW=30KHz, Sweep time=auto |
| Limit: | |

| Frequency range (MHz) | Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* Decreases with the logarithm of the frequency.

Test setup:




*Remark:*
*E.U.T: Equipment Under Test*
*LISN: Line Impedence Stabilization Network*
*Test table height=0.8m*

Test procedure:

1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.

| | | | | | | |
|---|---|---|---|---|---|---|
| Test Instruments: | Refer to section 6.0 for details | | | | | |
| Test mode: | Refer to section 5.2 for details | | | | | |
| Test environment: | Temp.: | 24 °C | Humid.: | 54% | Press.: | 1012mbar |
| Test voltage: | AC 120V, 60Hz | | | | | |
| Test results: | Pass | | | | | |

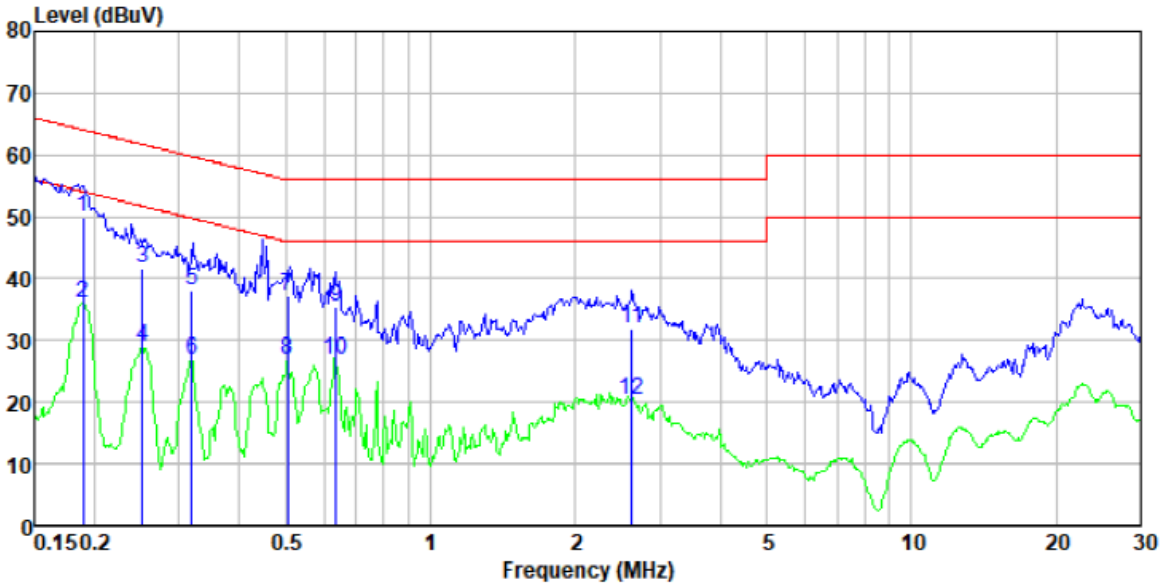
Remark: Both high and low voltages have been tested to show only the worst low voltage test data.

Pre-scan all channels, found worst case at 917MHz, and so only show the test result of 917MHz.

**Measurement data:**

**FP1:**

| Test mode: | 917MHz mode | Phase Polarity: | Line |
|---|---|---|---|

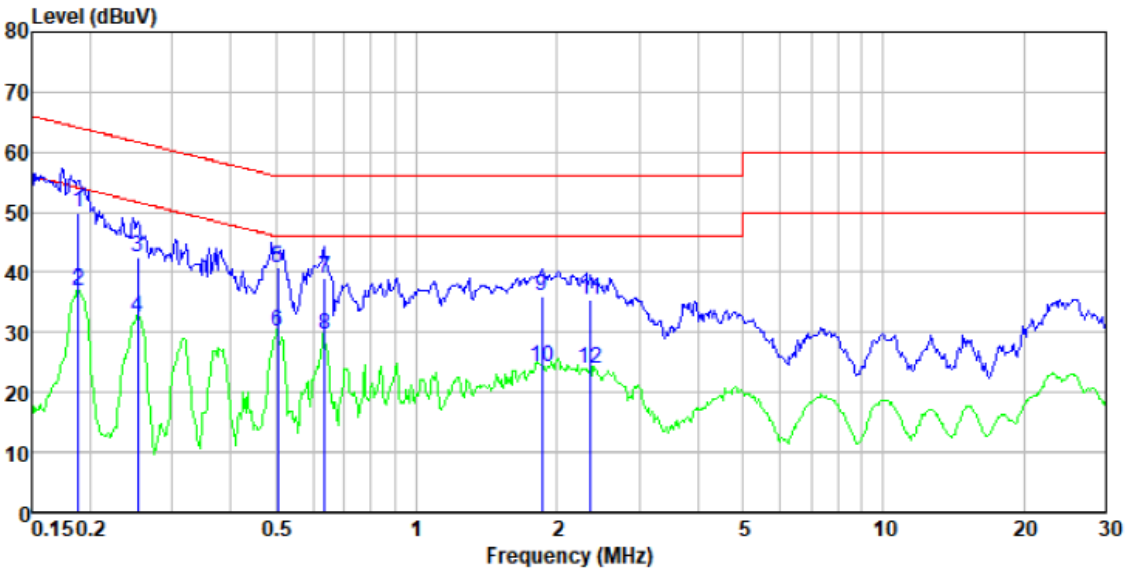



Condition : FCC PART15 CLASSB QP LINE

EUT name : Stage 1unminaires
Test Model : FP1
Test Mode : 900MHz
T & H : 24℃ 54%
Test Voltage: 120V/60Hz
Test Enginee: Sam
Remark :

| | Freq | Read Level | LISN Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.189 | 49.35 | 0.40 | 0.10 | 49.85 | 64.06 | -14.21 | QP |
| 2 | 0.189 | 35.44 | 0.40 | 0.10 | 35.94 | 54.06 | -18.12 | Average |
| 3 | 0.252 | 40.98 | 0.40 | 0.10 | 41.48 | 61.69 | -20.21 | QP |
| 4 | 0.252 | 28.35 | 0.40 | 0.10 | 28.85 | 51.69 | -22.84 | Average |
| 5 | 0.318 | 37.49 | 0.39 | 0.10 | 37.98 | 59.75 | -21.77 | QP |
| 6 | 0.318 | 26.34 | 0.39 | 0.10 | 26.83 | 49.75 | -22.92 | Average |
| 7 | 0.505 | 36.77 | 0.31 | 0.11 | 37.19 | 56.00 | -18.81 | QP |
| 8 | 0.505 | 26.54 | 0.31 | 0.11 | 26.96 | 46.00 | -19.04 | Average |
| 9 | 0.637 | 35.10 | 0.28 | 0.12 | 35.50 | 56.00 | -20.50 | QP |
| 10 | 0.637 | 26.50 | 0.28 | 0.12 | 26.90 | 46.00 | -19.10 | Average |
| 11 | 2.622 | 31.60 | 0.20 | 0.19 | 31.99 | 56.00 | -24.01 | QP |
| 12 | 2.622 | 20.04 | 0.20 | 0.19 | 20.43 | 46.00 | -25.57 | Average |

| Test mode: | 917MHz mode | Phase Polarity: | Neutral |
|---|---|---|---|



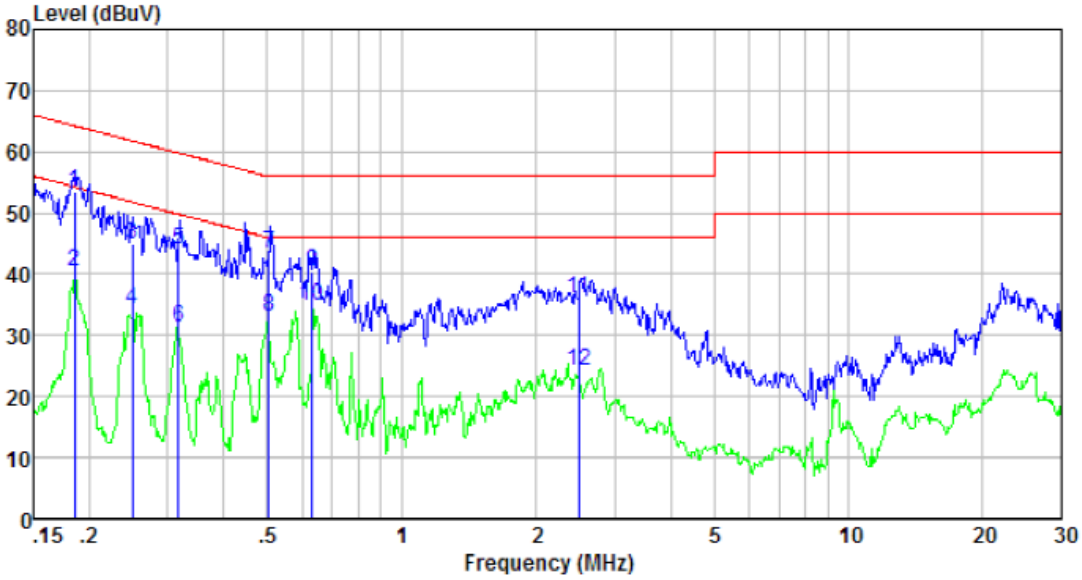

Condition : FCC PART15 CLASSB QP NEUTRAL

EUT name : Stage lunminaires
Test Model : FP1
Test Mode : 900MHz
T & H : 24℃ 54%
Test Voltage: 120V/60Hz
Test Enginee: Sam
Remark :

| | Freq | Read Level | LISN Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.188 | 49.40 | 0.40 | 0.10 | 49.90 | 64.11 | -14.21 | QP |
| 2 | 0.188 | 36.29 | 0.40 | 0.10 | 36.79 | 54.11 | -17.32 | Average |
| 3 | 0.253 | 42.16 | 0.40 | 0.10 | 42.66 | 61.64 | -18.98 | QP |
| 4 | 0.253 | 31.85 | 0.40 | 0.10 | 32.35 | 51.64 | -19.29 | Average |
| 5 | 0.505 | 40.18 | 0.31 | 0.11 | 40.60 | 56.00 | -15.40 | QP |
| 6 | 0.505 | 29.63 | 0.31 | 0.11 | 30.05 | 46.00 | -15.95 | Average |
| 7 | 0.637 | 38.69 | 0.28 | 0.12 | 39.09 | 56.00 | -16.91 | QP |
| 8 | 0.637 | 29.10 | 0.28 | 0.12 | 29.50 | 46.00 | -16.50 | Average |
| 9 | 1.858 | 35.73 | 0.20 | 0.17 | 36.10 | 56.00 | -19.90 | QP |
| 10 | 1.858 | 23.80 | 0.20 | 0.17 | 24.17 | 46.00 | -21.83 | Average |
| 11 | 2.358 | 35.00 | 0.20 | 0.18 | 35.38 | 56.00 | -20.62 | QP |
| 12 | 2.358 | 23.67 | 0.20 | 0.18 | 24.05 | 46.00 | -21.95 | Average |

**FP2:**

| Test mode: | 917MHz mode | Phase Polarity: | Line |
|---|---|---|---|

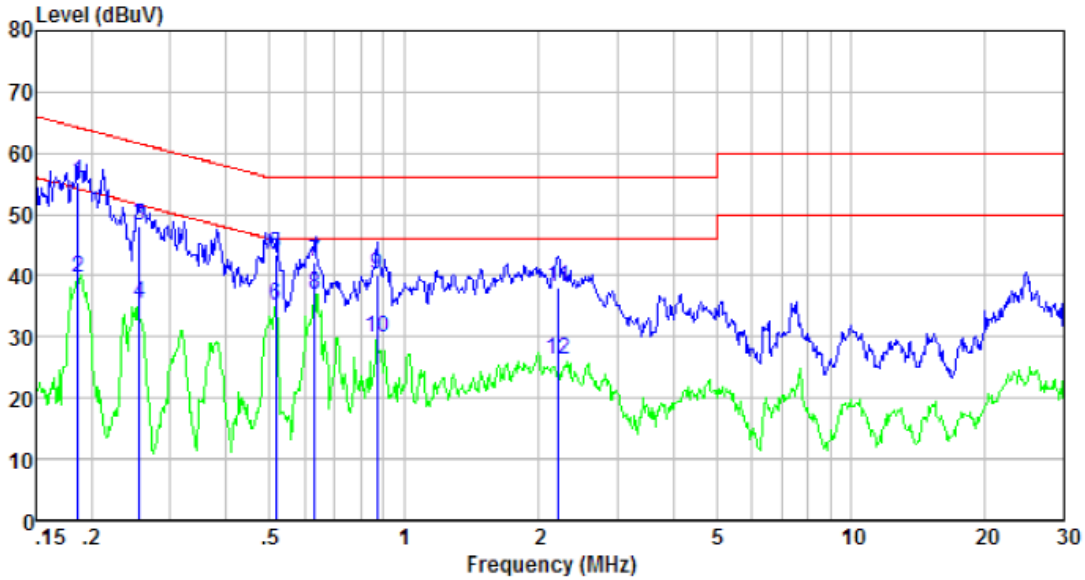



Condition : FCC PART15 CLASSB QP LISN-2017 LINE

EUT name : Stage lunminaires
Test Model : FP2
Test Mode : 900MHz
T & H : 24℃ 54%
Test Voltage: 120V/60Hz
Test Enginee: Sam
Remark :

| | Freq | Read Level | Cable Loss | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.185 | 52.87 | 0.10 | 0.50 | 53.37 | 64.24 | -10.87 | QP |
| 2 | 0.185 | 39.90 | 0.10 | 0.50 | 40.40 | 54.24 | -13.84 | Average |
| 3 | 0.249 | 44.50 | 0.10 | 0.50 | 45.00 | 61.78 | -16.78 | QP |
| 4 | 0.249 | 33.70 | 0.10 | 0.50 | 34.20 | 51.78 | -17.58 | Average |
| 5 | 0.317 | 43.44 | 0.10 | 0.49 | 43.93 | 59.80 | -15.87 | QP |
| 6 | 0.317 | 30.76 | 0.10 | 0.49 | 31.25 | 49.80 | -18.55 | Average |
| 7 | 0.505 | 42.93 | 0.11 | 0.42 | 43.35 | 56.00 | -12.65 | QP |
| 8 | 0.505 | 32.51 | 0.11 | 0.42 | 32.93 | 46.00 | -13.07 | Average |
| 9 | 0.630 | 39.99 | 0.12 | 0.40 | 40.39 | 56.00 | -15.61 | QP |
| 10 | 0.630 | 34.54 | 0.12 | 0.40 | 34.94 | 46.00 | -11.06 | Average |
| 11 | 2.487 | 35.64 | 0.18 | 0.38 | 36.02 | 56.00 | -19.98 | QP |
| 12 | 2.487 | 23.71 | 0.18 | 0.38 | 24.09 | 46.00 | -21.91 | Average |

| Test mode: | 917MHz mode | Phase Polarity: | Neutral |
|---|---|---|---|




Condition : FCC PART15 CLASSB QP LISN-2017 NEUTRAL

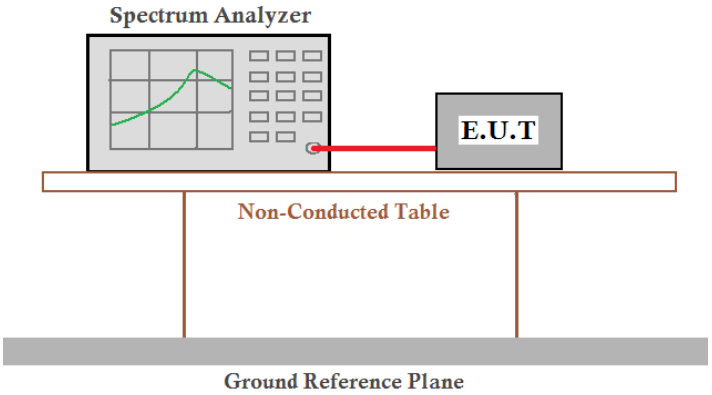
EUT name : Stage lunminaires
Test Model : FP2
Test Mode : 900MHz
T & H : 24℃ 54%
Test Voltage: 120V/60Hz
Test Enginee: Sam
Remark :

| | Freq | Read Level | Cable Loss | Factor | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB | dB | dBuV | dBuV | dB | |
| 1 | 0.186 | 54.82 | 0.10 | 0.50 | 55.32 | 64.20 | -8.88 | QP |
| 2 | 0.186 | 38.98 | 0.10 | 0.50 | 39.48 | 54.20 | -14.72 | Average |
| 3 | 0.256 | 47.63 | 0.10 | 0.50 | 48.13 | 61.56 | -13.43 | QP |
| 4 | 0.256 | 35.06 | 0.10 | 0.50 | 35.56 | 51.56 | -16.00 | Average |
| 5 | 0.516 | 42.99 | 0.11 | 0.42 | 43.41 | 56.00 | -12.59 | QP |
| 6 | 0.516 | 34.61 | 0.11 | 0.42 | 35.03 | 46.00 | -10.97 | Average |
| 7 | 0.630 | 41.79 | 0.12 | 0.40 | 42.19 | 56.00 | -13.81 | QP |
| 8 | 0.630 | 36.46 | 0.12 | 0.40 | 36.86 | 46.00 | -9.14 | Average |
| 9 | 0.871 | 39.79 | 0.14 | 0.36 | 40.15 | 56.00 | -15.85 | QP |
| 10 | 0.871 | 29.41 | 0.14 | 0.36 | 29.77 | 46.00 | -16.23 | Average |
| 11 | 2.213 | 37.67 | 0.18 | 0.38 | 38.05 | 56.00 | -17.95 | QP |
| 12 | 2.213 | 25.81 | 0.18 | 0.38 | 26.19 | 46.00 | -19.81 | Average |

*Notes:*

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss

## 7.3 Conducted Peak Output Power

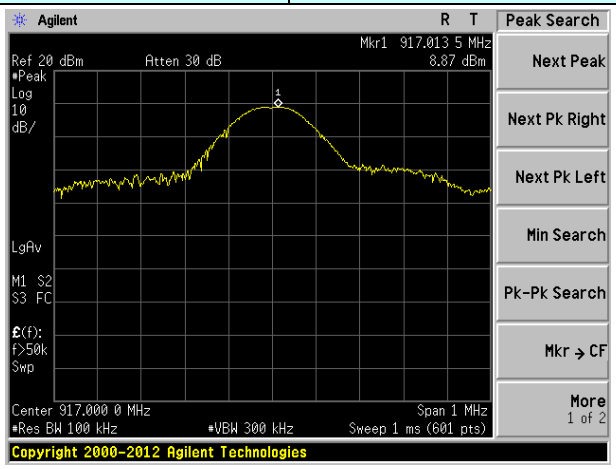
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (b)(2) |
| Test Method: | ANSI C63.10:2013 |
| Limit: | 30dBm(for GFSK) |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data**

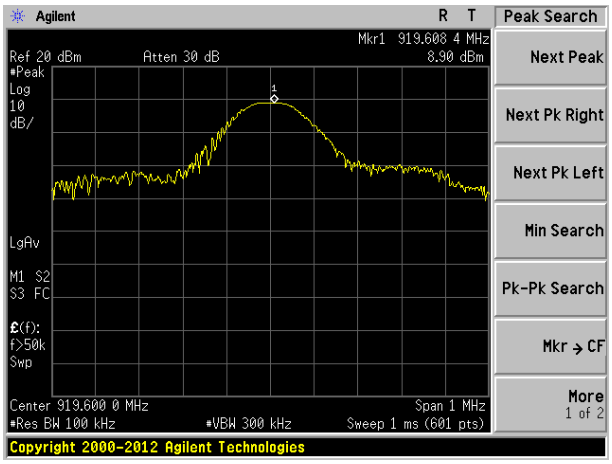
| Test channel | Peak Output Power (dBm) | Limit (dBm) | Result |
|---|---|---|---|
| Lowest | 8.87 | 30.00 | Pass |
| Middle | 8.90 | | |
| Highest | 8.90 | | |

**Test plot as follows:**

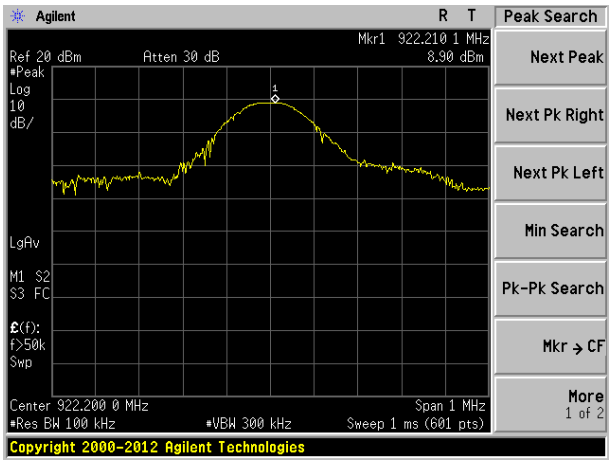
| Test mode: | GFSK mode |
|---|---|




Lowest channel

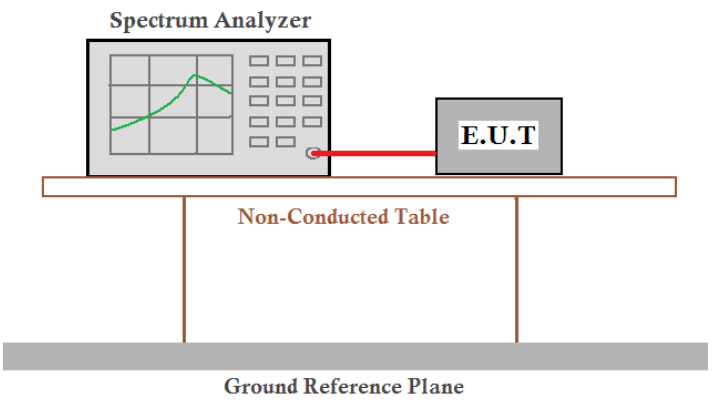



Middle channel




Highest channel

## 7.4 20dB Emission Bandwidth

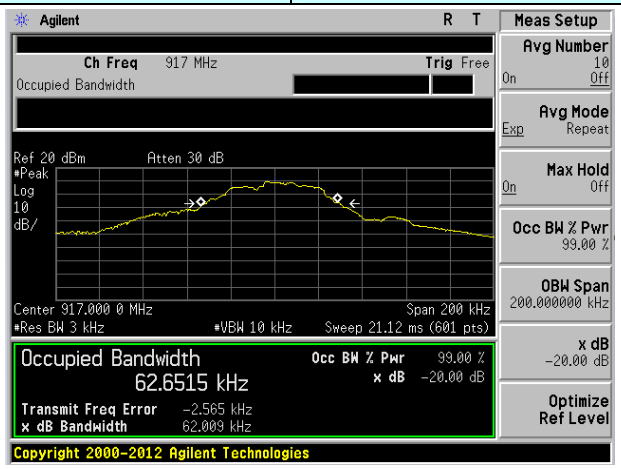
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1)(i) |
| Test Method: | ANSI C63.10:2013 |
| Limit: | N/A |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data**

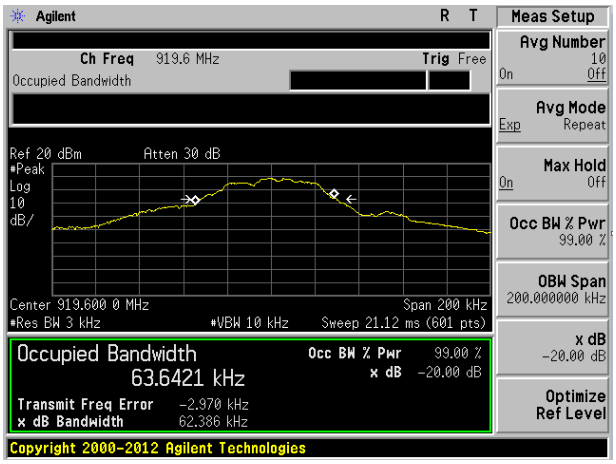
| Test channel | 20dB Emission Bandwidth (MHz) | Result |
|---|---|---|
| Lowest | 0.062009 | Pass |
| Middle | 0.062386 | |
| Highest | 0.062049 | |

**Test plot as follows:**

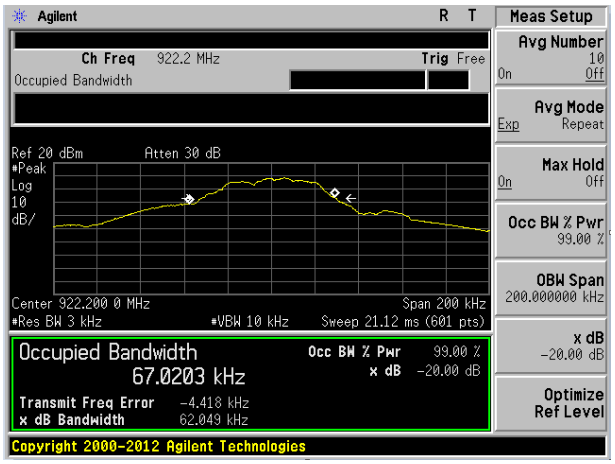
| Test mode: | GFSK mode |
|---|---|




Lowest channel

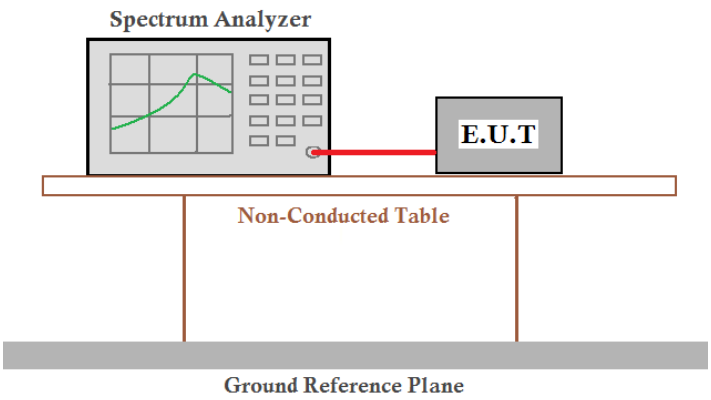



Middle channel




Highest channel

## 7.5 Carrier Frequencies Separation

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1)(i) |
| Test Method: | ANSI C63.10:2013 |
| Receiver setup: | RBW=30KHz, VBW=100KHz, detector=Peak |
| Limit: | 20dB bandwidth |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data**

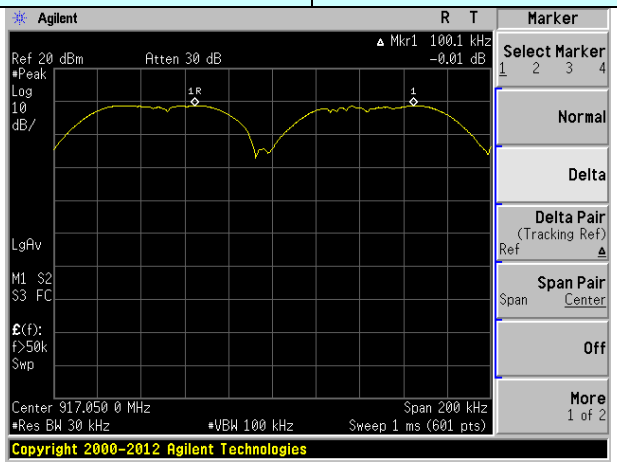
| Test channel | Carrier Frequencies Separation (kHz) | Limit (kHz) | Result |
|---|---|---|---|
| Lowest | 100.1 | 62.386 | Pass |
| Middle | 100.1 | 62.386 | Pass |
| Highest | 100.1 | 62.386 | Pass |

*Note: According to section 7.4*

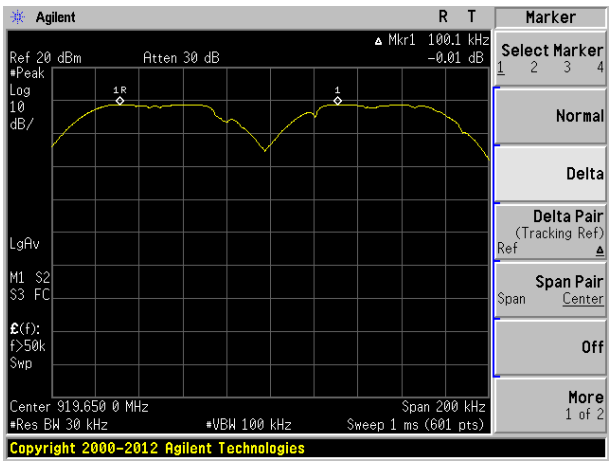
| 20dB bandwidth (kHz) (worse case) | Limit (kHz) (Carrier Frequencies Separation) |
|---|---|
| 62.386 | 62.386 |

**Test plot as follows:**

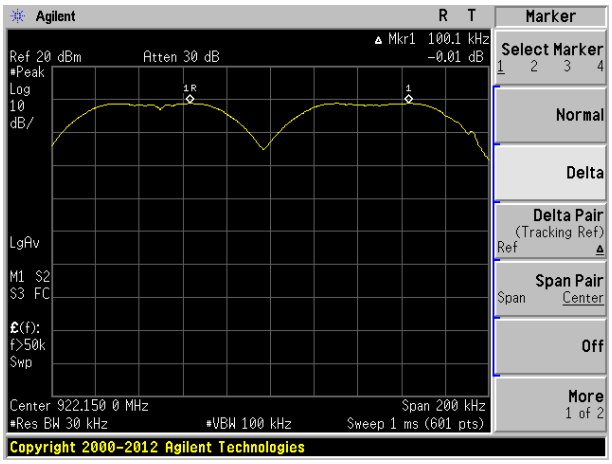
| Modulation mode: | GFSK |
|---|---|




Lowest channel

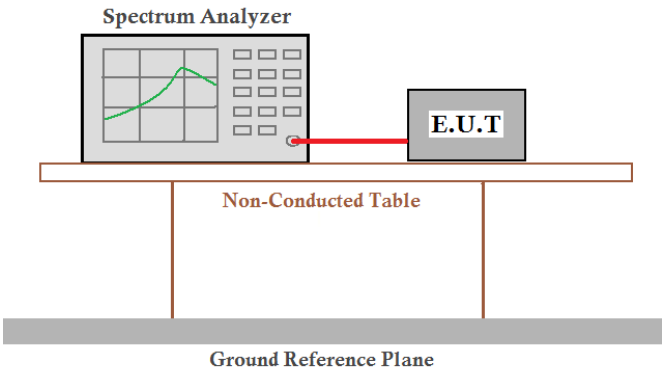



Middle channel




Highest channel

## 7.6 Hopping Channel Number

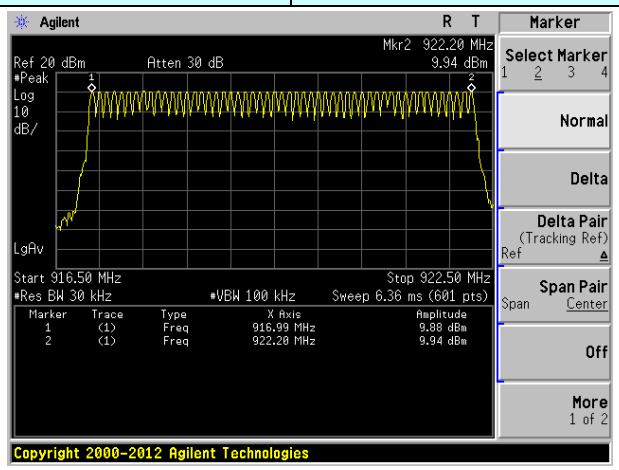
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1)(i) |
| Test Method: | ANSI C63.10:2013 |
| Receiver setup: | RBW=30kHz, VBW=100kHz, Frequency range=916.5MHz-922.5MHz, Detector=Peak |
| Limit: | 50 channels |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

**Measurement Data:**

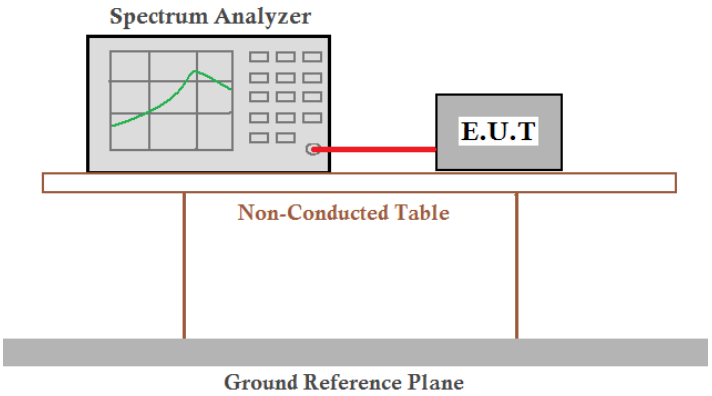
| Mode | Hopping channel numbers | Limit | Result |
|---|---|---|---|
| GFSK | 53 | 50 | Pass |

**Test plot as follows:**

| Test mode: | GFSK |
|---|---|



## 7.7 Dwell Time

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (a)(1)(i) |
| Test Method: | ANSI C63.10:2013 |
| Receiver setup: | RBW=10kHz, VBW=30kHz, Span=0Hz, Detector=Peak |
| Limit: | 0.4 Second |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

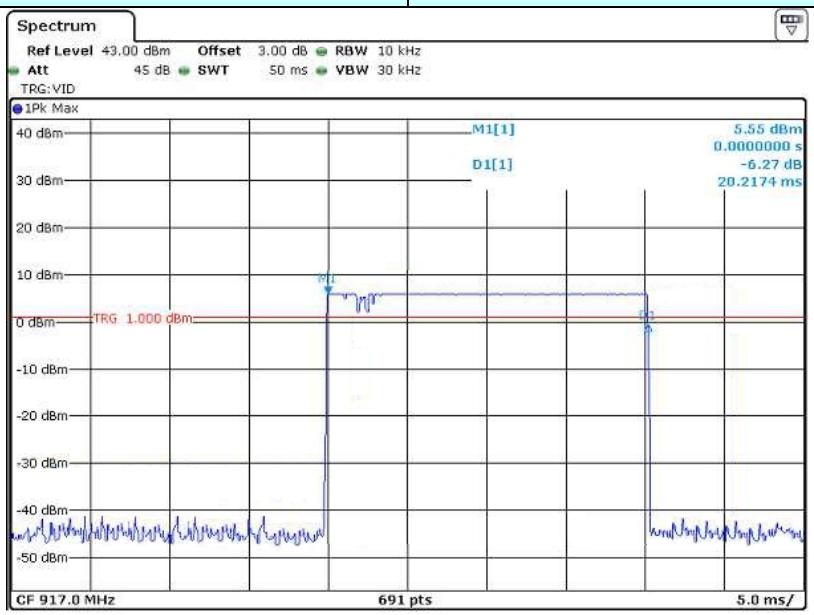
**Measurement Data**

| Frequency(MHz) | Dwell time Per Hop (s) | Number of hopping channels in 20s | Dwell time (s) | Limit (s) |
|---|---|---|---|---|
| 917.00 | 0.0202 | 14 | 0.28 | 0.4 |
| 919.60 | 0.0202 | 14 | 0.28 | 0.4 |
| 922.20 | 0.0202 | 13 | 0.26 | 0.4 |

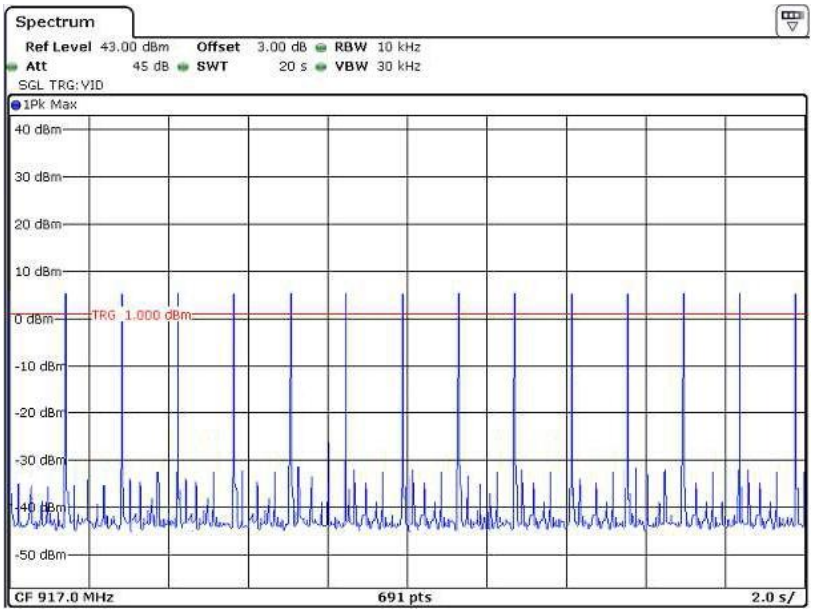
Note: For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

**Test plot as follows:**

| Test channel | Lowest |
|---|---|

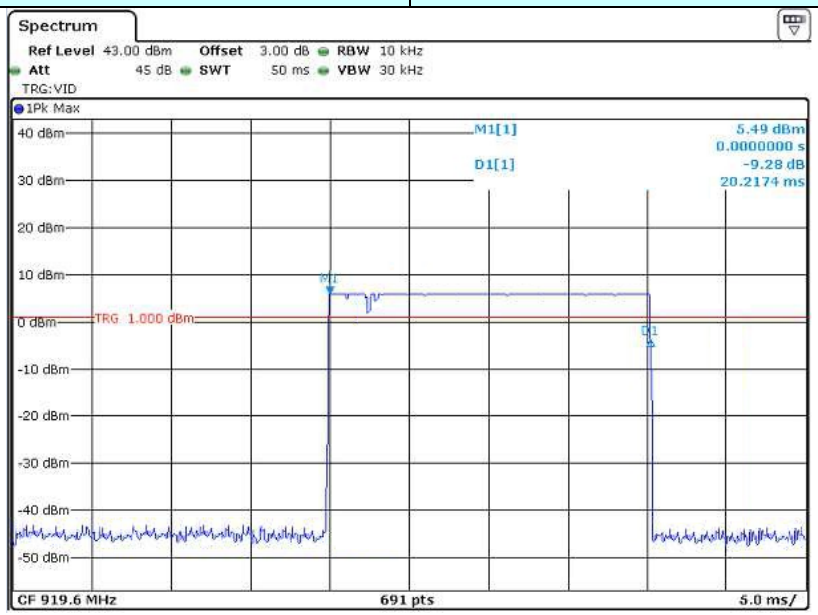



Ton

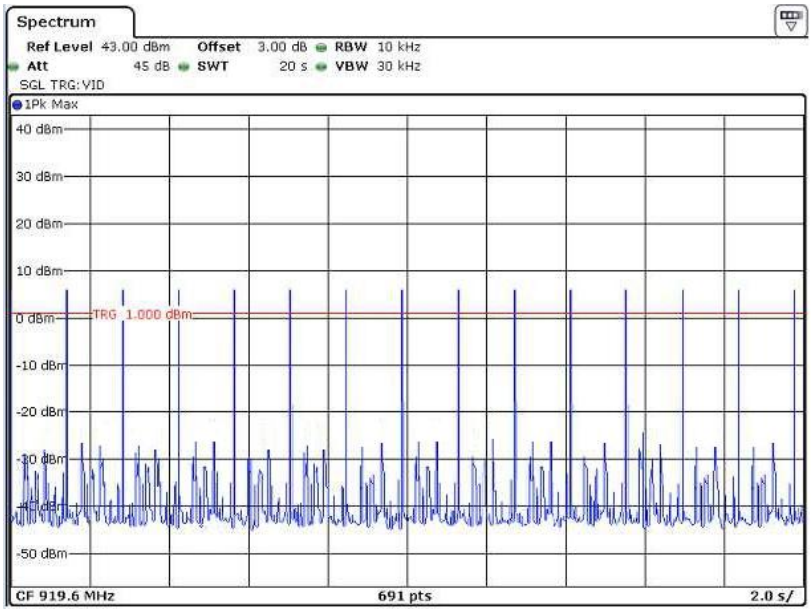



Ton times in 20s

| Test channel | Middle |
|---|---|

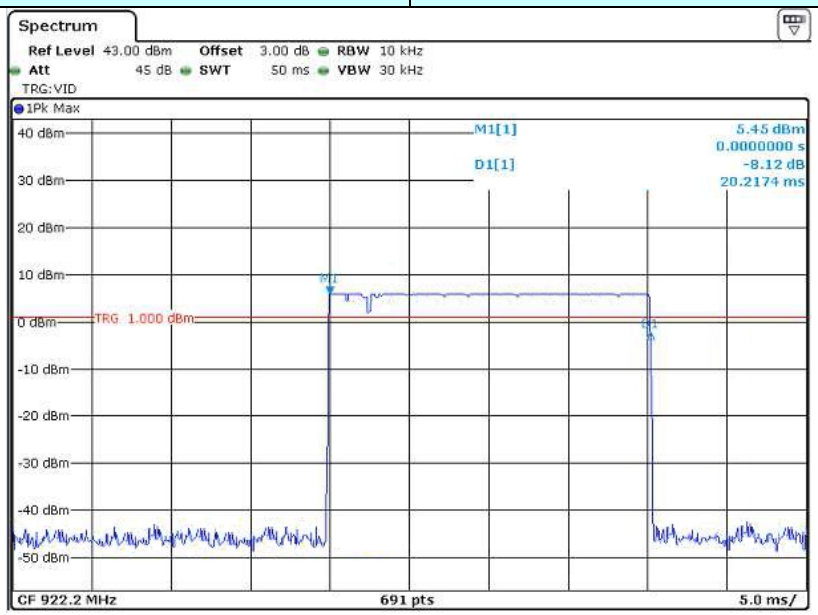



Ton

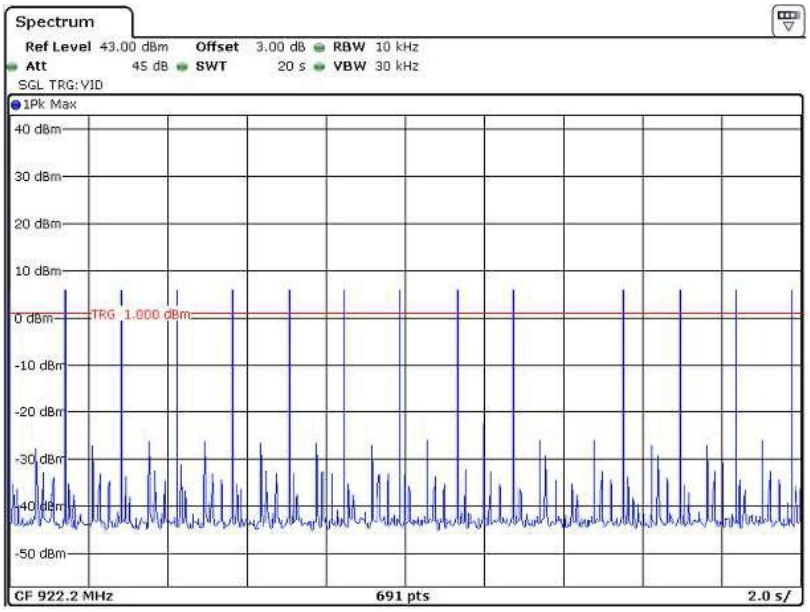



Ton times in 20s

| Test channel | Highest |
|---|---|




Ton




Ton times in 20s

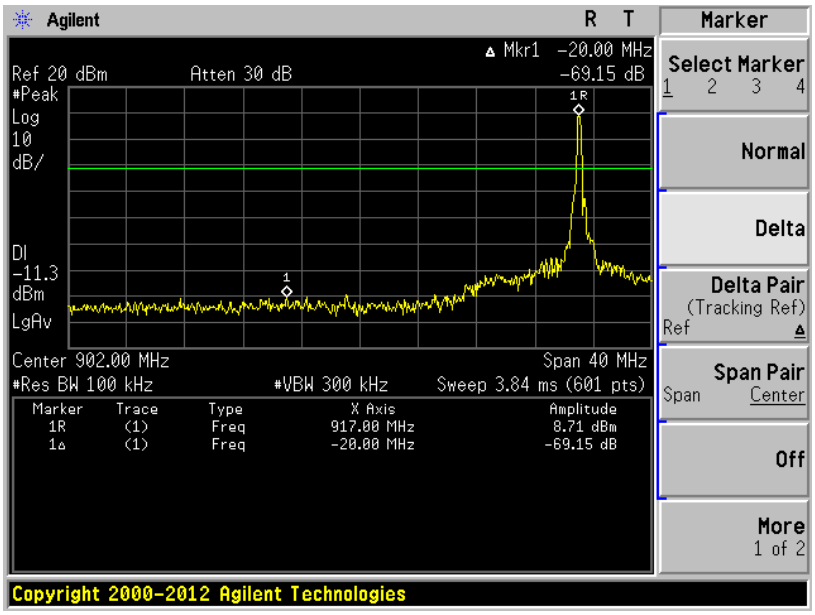
## 7.8 Band Edge

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (d) |
| Test Method: | ANSI C63.10:2013 |
| Receiver setup: | RBW=100kHz, VBW=300kHz, Detector=Peak |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

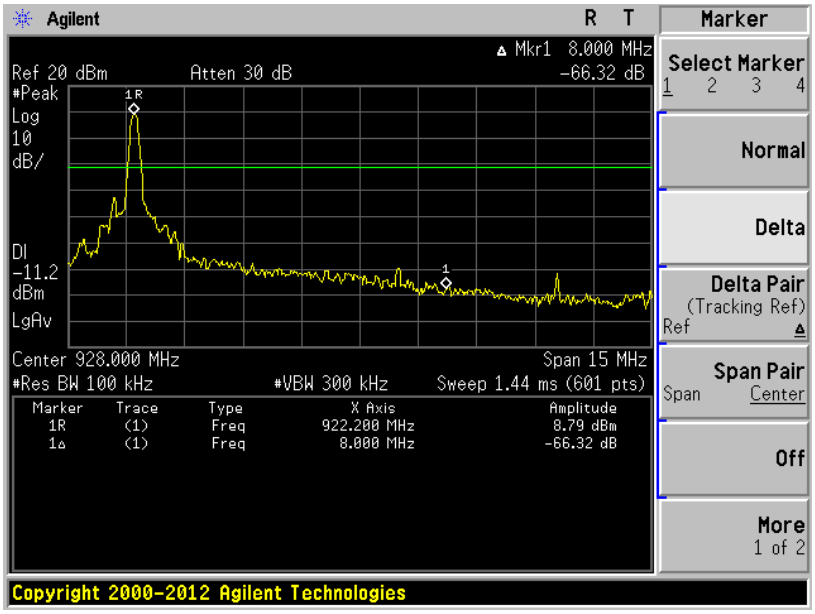
## Out of Band Conducted Emissions, FCC Rule 15.247(d):

In any 100 KHz bandwidth outside the EUT passband, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission.

**Lower channel 917.00 MHz:**

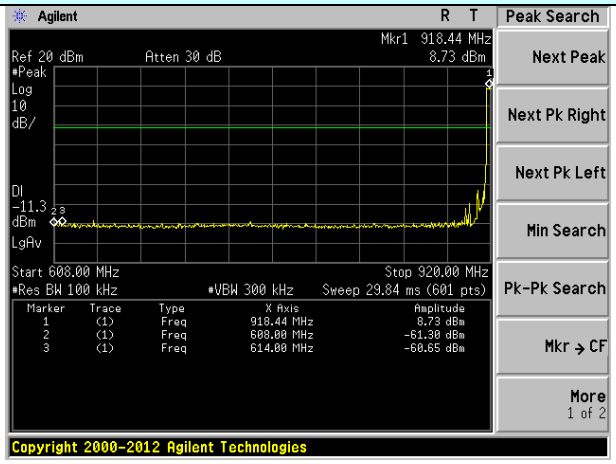



**Upper channel 922.20 MHz:**

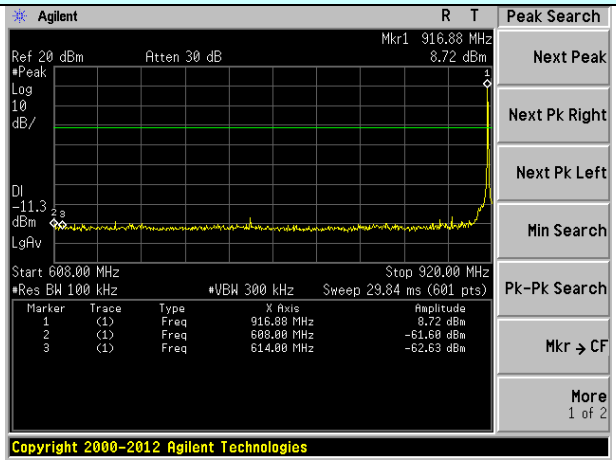


**Test plot as follows:**

| Test channel: | Lowest channel |
|---|---|

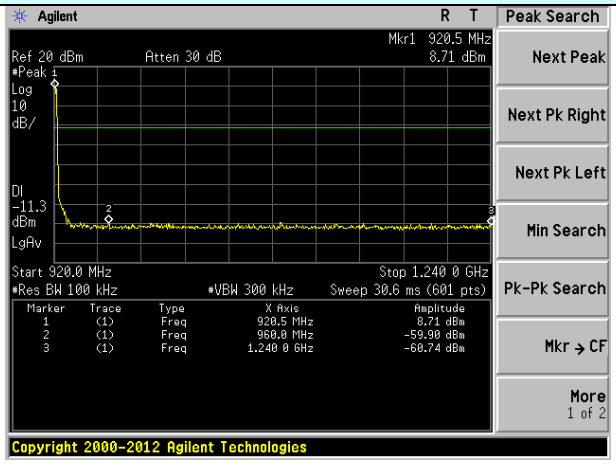



Hopping mode

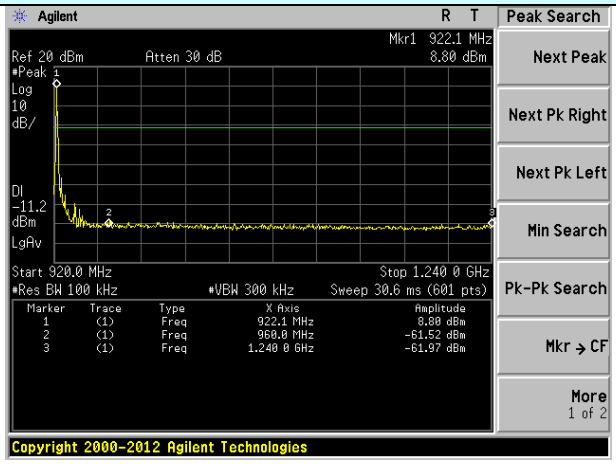



No-hopping mode

| Test channel: | Highest channel |
|---|---|



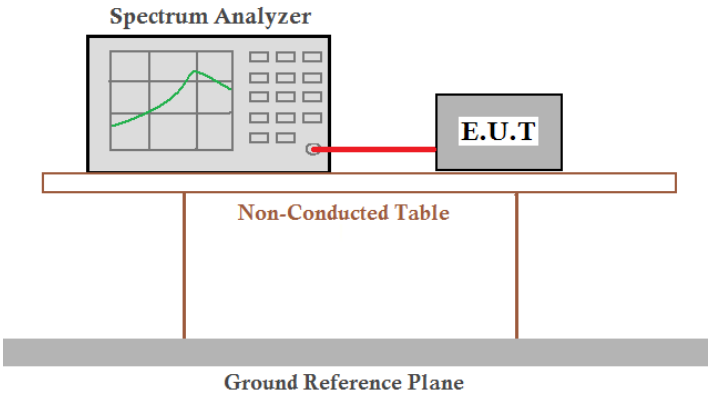

Hopping mode




No-hopping mode

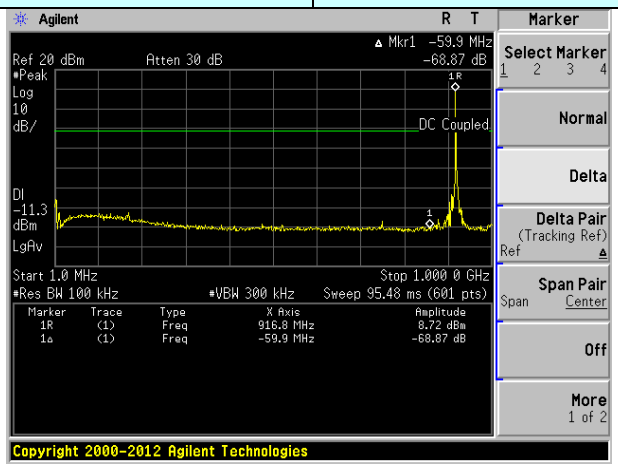
## 7.9 Spurious Emission

### 7.9.1 Conducted Emission Method

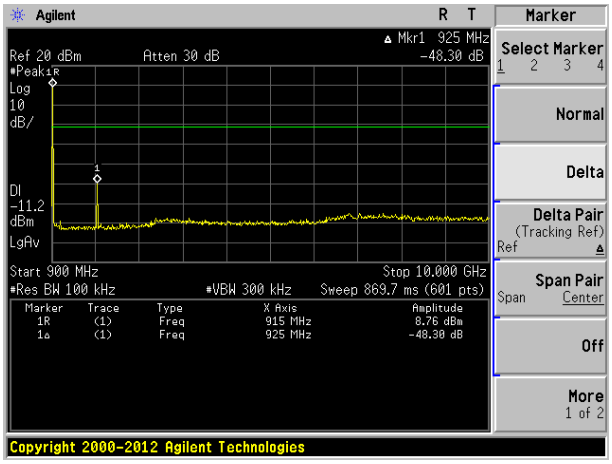
| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.247 (d) |
| Test Method: | ANSI C63.10:2013 |
| Limit: | In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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. |
| Test setup: |  |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |
| Test results: | Pass |

All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

| Test channel: | Lowest channel |
|---|---|

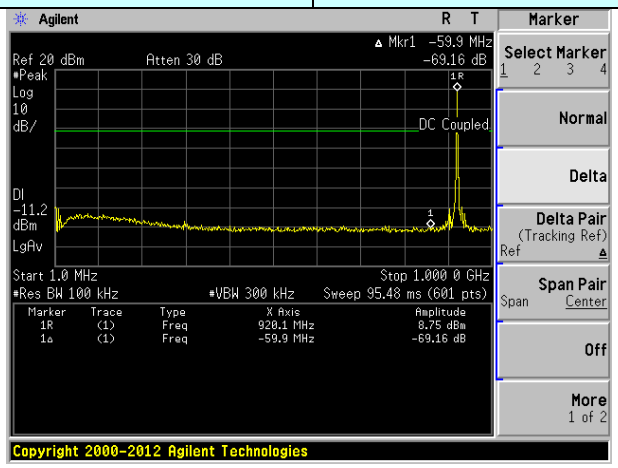



1M-1G

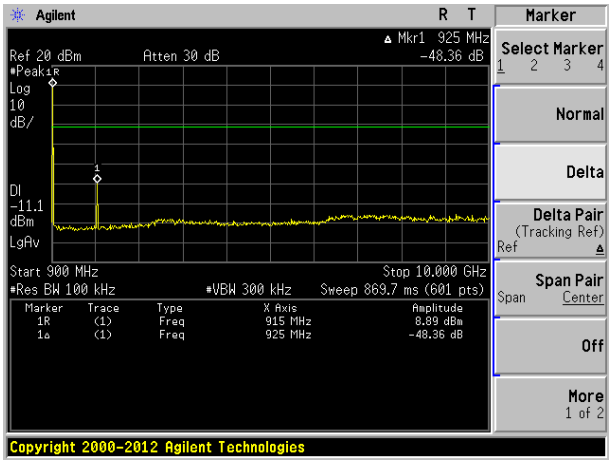



900M-10G

| Test channel: | Middle channel |
|---|---|

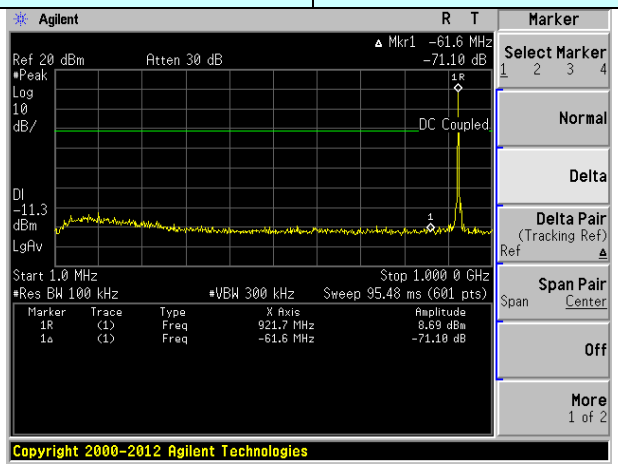



1M-1G

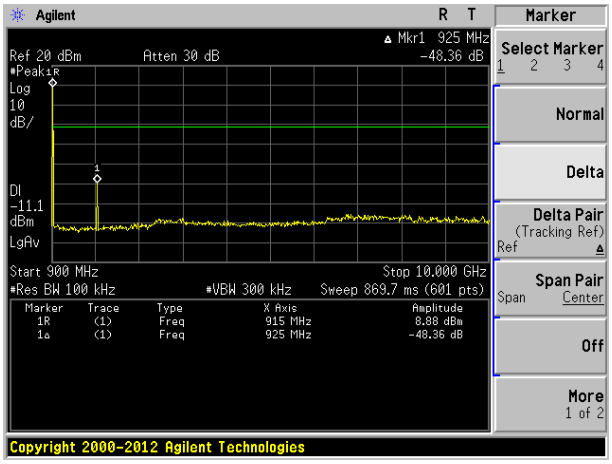



900M-10G

| Test channel: | Highest channel |
|---|---|




1M-1G




900M-10G

### 7.9.2 Radiated Emission Method

| | |
|---|---|
| Test Requirement: | FCC Part15 C Section 15.209 |
| Test Method: | ANSI C63.10:2013 |
| Test Frequency Range: | 9kHz to 25GHz |
| Test site: | Measurement Distance: 3m |

**Receiver setup:**

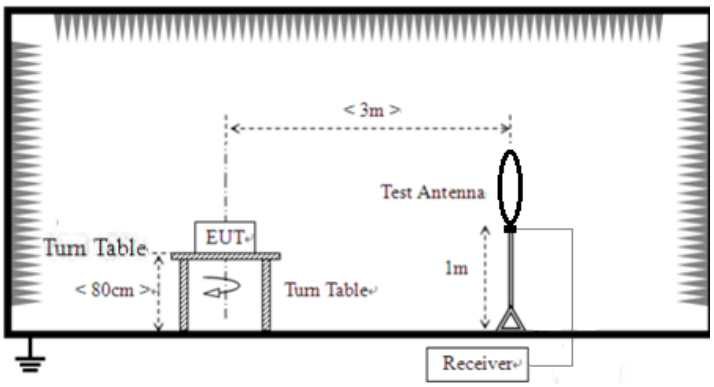
| Frequency | Detector | RBW | VBW | Value |
|---|---|---|---|---|
| 9KHz-150KHz | Quasi-peak | 200Hz | 600Hz | Quasi-peak |
| 150KHz-30MHz | Quasi-peak | 9KHz | 30KHz | Quasi-peak |
| 30MHz-1GHz | Quasi-peak | 120KHz | 300KHz | Quasi-peak |
| Above 1GHz | Peak | 1MHz | 3MHz | Peak |
| | Peak | 1MHz | 10Hz | Average |

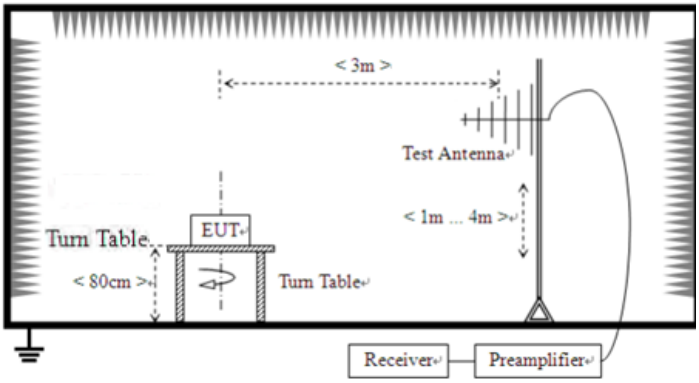
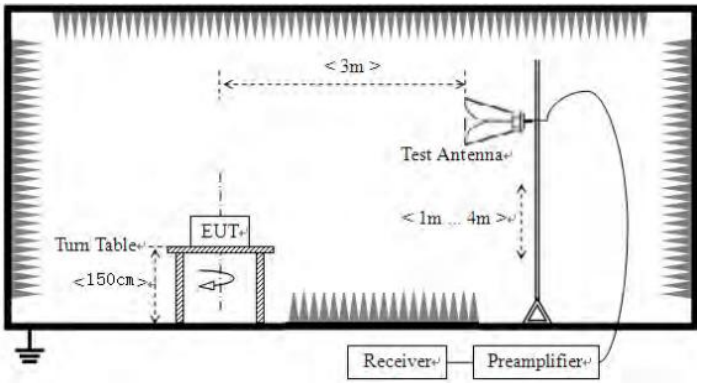
**Limit:**

| Frequency | Limit (uV/m) | Value | Measurement Distance |
|---|---|---|---|
| 0.009MHz-0.490MHz | 2400/F(KHz) | QP | 300m |
| 0.490MHz-1.705MHz | 24000/F(KHz) | QP | 30m |
| 1.705MHz-30MHz | 30 | QP | 30m |
| 30MHz-88MHz | 100 | QP | 3m |
| 88MHz-216MHz | 150 | QP | |
| 216MHz-960MHz | 200 | QP | |
| 960MHz-1GHz | 500 | QP | |
| Above 1GHz | 500 | Average | |
| | 5000 | Peak | |

**Test setup:**

For radiated emissions from 9kHz to 30MHz



| | |
|---|---|
| | For radiated emissions from 30MHz to1GHz<br>  <br><br>For radiated emissions above 1GHz<br>  <br> |
| Test Procedure: | 1. The EUT was placed on the top of a rotating table (0.8m for below 1G and 1.5m for above 1G) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.<br>2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.<br>3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.<br>4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.<br>5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.<br>6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. |
| Test Instruments: | Refer to section 6.0 for details |
| Test mode: | Refer to section 5.2 for details |

| | | | | | | |
|---|---|---|---|---|---|---|
| Test environment: | Temp.: | 24-25 °C | Humid.: | 48-49% | Press.: | 1012mbar |
| Test voltage: | AC 120V, 60Hz | | | | | |
| Test results: | Pass | | | | | |

**Measurement data:**

*Remarks:*

*1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

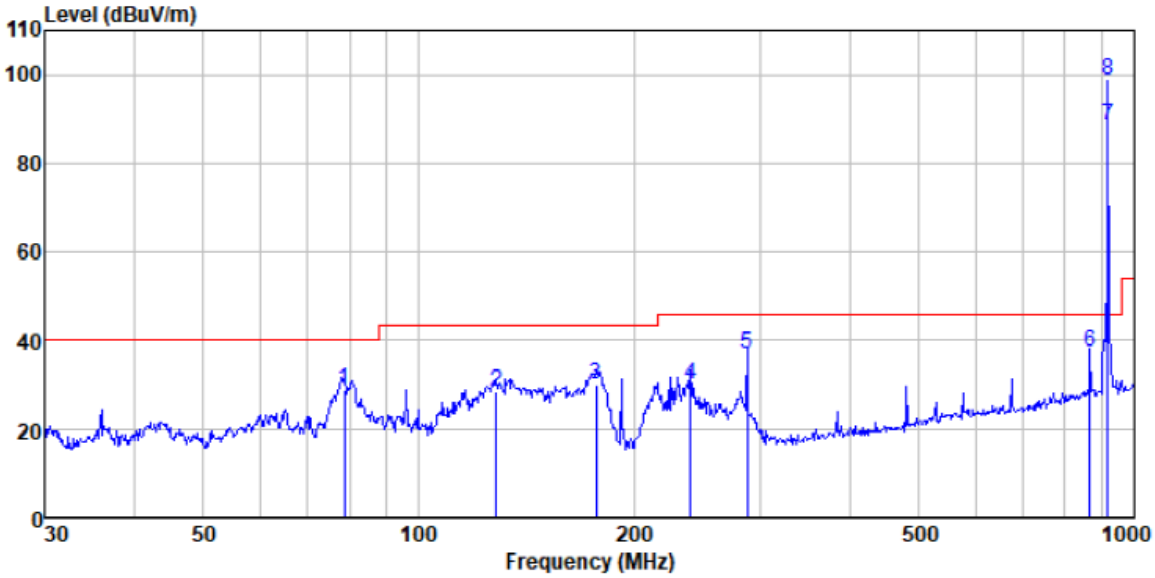
■ **9kHz~30MHz**

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

**FP1:**

■ **Below 1GHz**

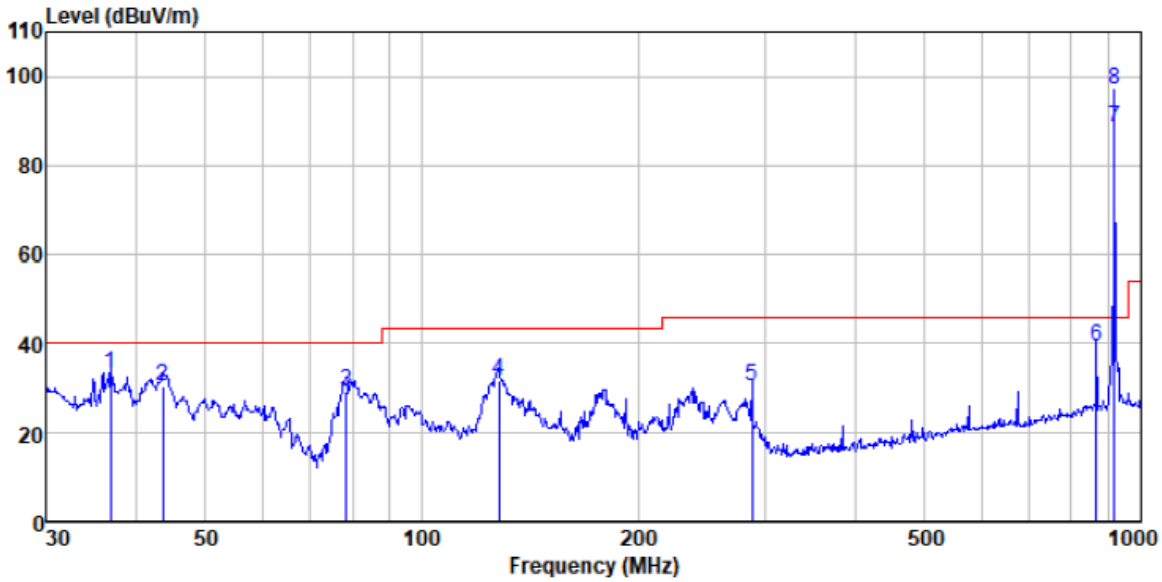
| Antenna Polarity: | Horizontal | Test channel: | Lowest |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m HORIZONTAL
EUT : Stage luminaires
Test Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 917MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 78.689 | 56.97 | 7.33 | 36.53 | 1.02 | 28.79 | 40.00 | -11.21 | QP |
| 2 | 128.563 | 55.53 | 8.43 | 36.94 | 1.43 | 28.45 | 43.50 | -15.05 | QP |
| 3 | 176.888 | 57.06 | 8.60 | 37.22 | 1.72 | 30.16 | 43.50 | -13.34 | QP |
| 4 | 239.987 | 53.92 | 11.56 | 37.37 | 2.07 | 30.18 | 46.00 | -15.82 | QP |
| 5 | 287.990 | 59.04 | 13.11 | 37.41 | 2.31 | 37.05 | 46.00 | -8.95 | QP |
| 6 | 866.088 | 48.13 | 21.91 | 37.61 | 4.73 | 37.16 | 46.00 | -8.84 | QP |
| 7 * | 917.000 | 99.03 | 22.31 | 37.58 | 4.91 | 88.67 | 46.00 | 42.67 | Average |
| 8 * | 917.000 | 108.80 | 22.31 | 37.58 | 4.91 | 98.44 | 46.00 | 52.44 | Peak |

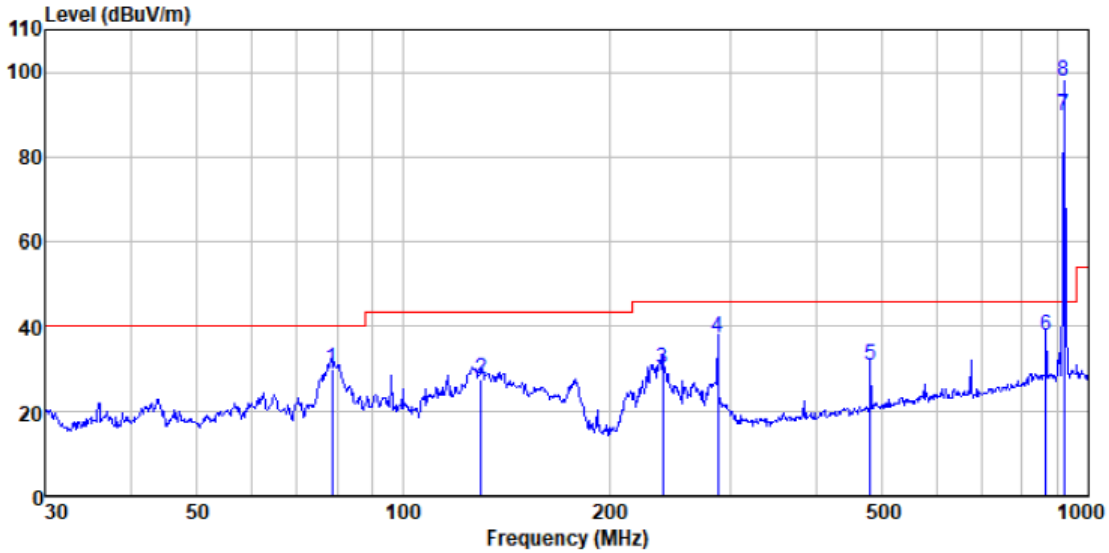
| Antenna Polarity: | Vertical | Test channel: | Lowest |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m VERTICAL
EUT : Stage luminaires
Test Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 917MHz

| | | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | | 36.895 | 57.11 | 11.20 | 35.48 | 0.63 | 33.46 | 40.00 | -6.54 | QP |
| 2 | | 43.659 | 53.16 | 12.25 | 35.87 | 0.70 | 30.24 | 40.00 | -9.76 | QP |
| 3 | | 78.413 | 57.57 | 7.33 | 36.53 | 1.01 | 29.38 | 40.00 | -10.62 | QP |
| 4 | | 128.113 | 58.69 | 8.43 | 36.94 | 1.42 | 31.60 | 43.50 | -11.90 | QP |
| 5 | | 287.990 | 52.52 | 13.11 | 37.41 | 2.31 | 30.53 | 46.00 | -15.47 | QP |
| 6 | | 866.088 | 50.41 | 21.91 | 37.61 | 4.73 | 39.44 | 46.00 | -6.56 | QP |
| 7 | * | 917.000 | 98.75 | 22.31 | 37.58 | 4.91 | 88.39 | 46.00 | 42.39 | Average |
| 8 | * | 917.000 | 107.57 | 22.31 | 37.58 | 4.91 | 97.21 | 46.00 | 51.21 | Peak |

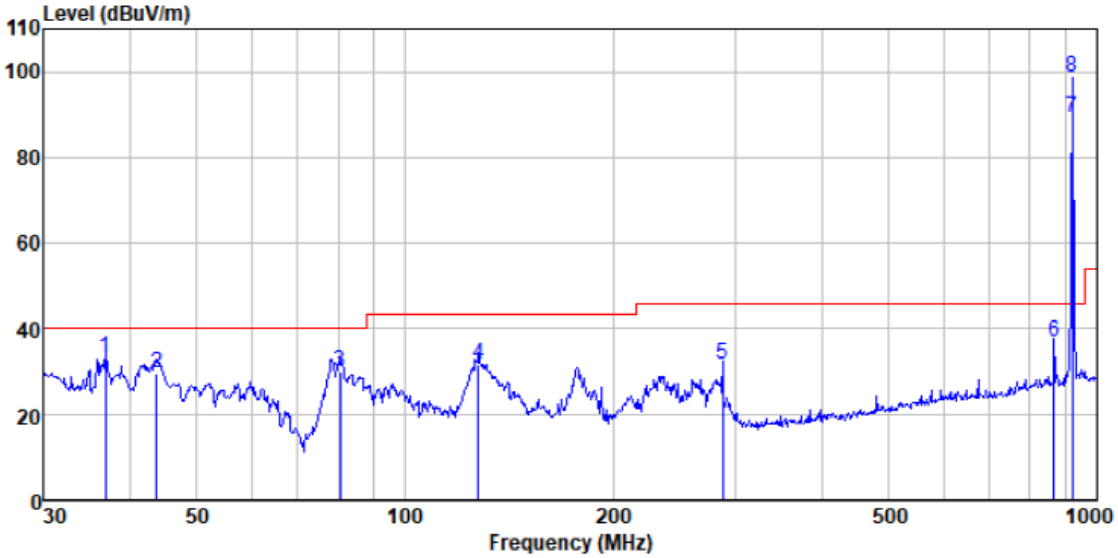
| Antenna Polarity: | Horizontal | Test channel: | Middle |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m HORIZONTAL
EUT : Stage luminaires
Test Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 919.6MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 78.689 | 58.05 | 7.33 | 36.53 | 1.02 | 29.87 | 40.00 | -10.13 | QP |
| 2 | 129.923 | 54.98 | 8.10 | 36.95 | 1.44 | 27.57 | 43.50 | -15.93 | QP |
| 3 | 239.147 | 53.83 | 11.46 | 37.37 | 2.06 | 29.98 | 46.00 | -16.02 | QP |
| 4 | 287.990 | 59.26 | 13.11 | 37.41 | 2.31 | 37.27 | 46.00 | -8.73 | QP |
| 5 | 480.528 | 48.13 | 17.14 | 37.51 | 3.22 | 30.98 | 46.00 | -15.02 | QP |
| 6 | 866.088 | 48.92 | 21.91 | 37.61 | 4.73 | 37.95 | 46.00 | -8.05 | QP |
| 7 * | 919.600 | 99.97 | 22.32 | 37.58 | 4.93 | 89.64 | 46.00 | 43.64 | Average |
| 8 * | 919.600 | 108.20 | 22.32 | 37.58 | 4.93 | 97.87 | 46.00 | 51.87 | Peak |

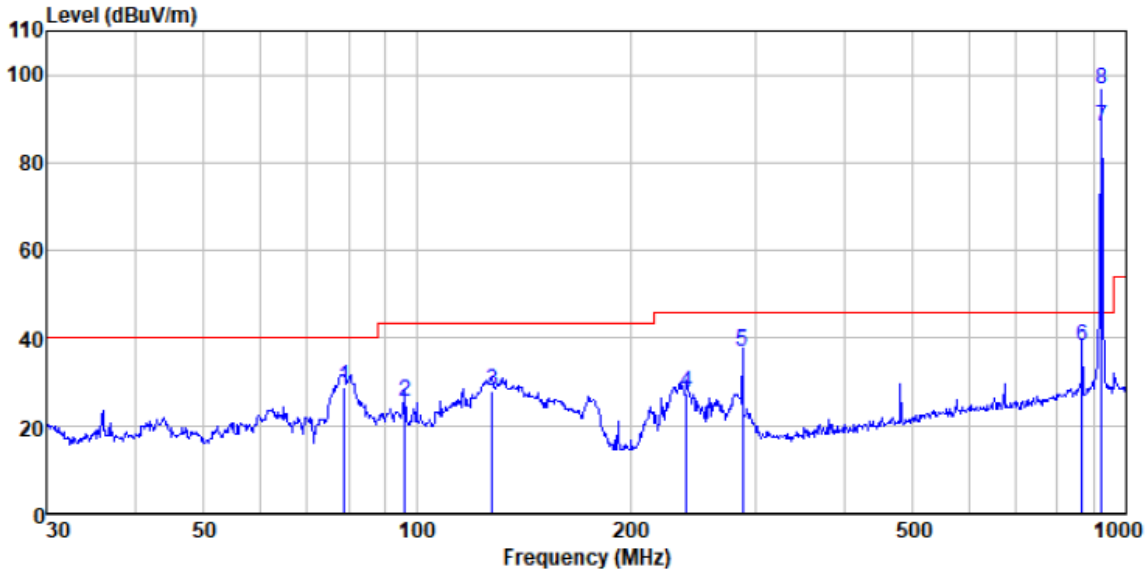
| Antenna Polarity: | Vertical | Test channel: | Middle |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m VERTICAL
EUT : Stage luminaires
Test Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 919.6MHz

| | | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | | 36.895 | 56.83 | 11.20 | 35.48 | 0.63 | 33.18 | 40.00 | -6.82 | QP |
| 2 | | 43.812 | 52.72 | 12.25 | 35.87 | 0.71 | 29.81 | 40.00 | -10.19 | QP |
| 3 | | 80.644 | 58.26 | 7.30 | 36.55 | 1.03 | 30.04 | 40.00 | -9.96 | QP |
| 4 | | 127.665 | 58.66 | 8.43 | 36.93 | 1.42 | 31.58 | 43.50 | -11.92 | QP |
| 5 | | 287.990 | 53.56 | 13.11 | 37.41 | 2.31 | 31.57 | 46.00 | -14.43 | QP |
| 6 | | 866.088 | 47.86 | 21.91 | 37.61 | 4.73 | 36.89 | 46.00 | -9.11 | QP |
| 7 | * | 919.600 | 99.55 | 22.32 | 37.58 | 4.93 | 89.22 | 46.00 | 43.22 | Average |
| 8 | * | 919.600 | 108.86 | 22.32 | 37.58 | 4.93 | 98.53 | 46.00 | 52.53 | Peak |

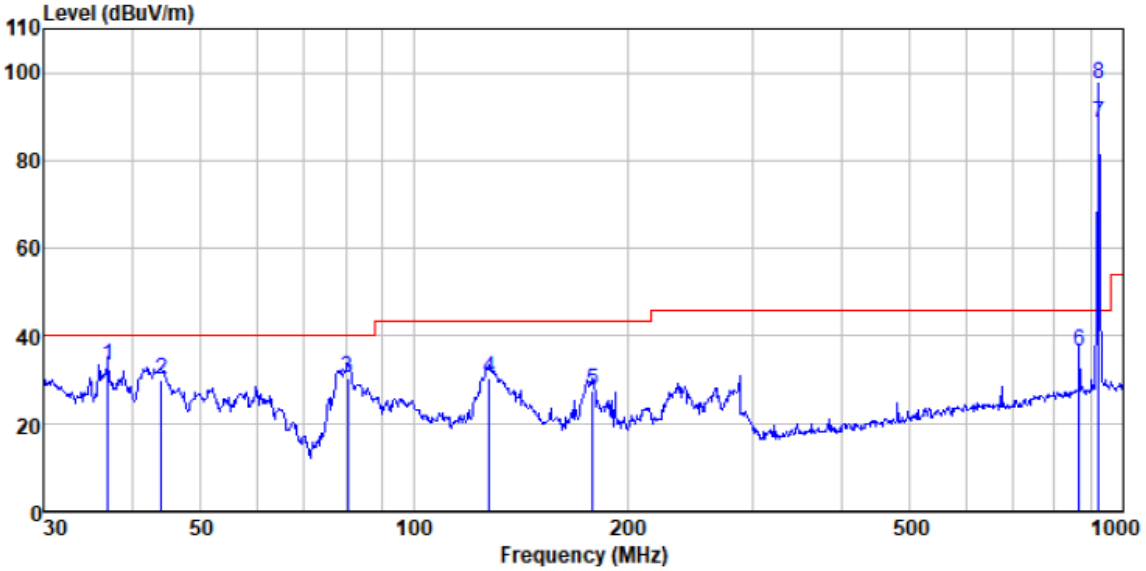
| Antenna Polarity: | Horizontal | Test channel: | Highest |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m HORIZONTAL
EUT : Stage luminaires
Test Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 922.2MHz

| | | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | | 78.965 | 56.98 | 7.33 | 36.54 | 1.02 | 28.79 | 40.00 | -11.21 | QP |
| 2 | | 96.099 | 49.59 | 11.35 | 36.69 | 1.16 | 25.41 | 43.50 | -18.09 | QP |
| 3 | | 127.665 | 54.96 | 8.43 | 36.93 | 1.42 | 27.88 | 43.50 | -15.62 | QP |
| 4 | | 239.987 | 51.26 | 11.56 | 37.37 | 2.07 | 27.52 | 46.00 | -18.48 | QP |
| 5 | | 287.990 | 58.90 | 13.11 | 37.41 | 2.31 | 36.91 | 46.00 | -9.09 | QP |
| 6 | | 866.088 | 49.17 | 21.91 | 37.61 | 4.73 | 38.20 | 46.00 | -7.80 | QP |
| 7 | * | 922.200 | 98.23 | 22.32 | 37.58 | 4.93 | 87.90 | 46.00 | 41.90 | Average |
| 8 | * | 922.200 | 106.93 | 22.32 | 37.58 | 4.93 | 96.60 | 46.00 | 50.60 | Peak |

| Antenna Polarity: | Vertical | Test channel: | Highest |
|---|---|---|---|

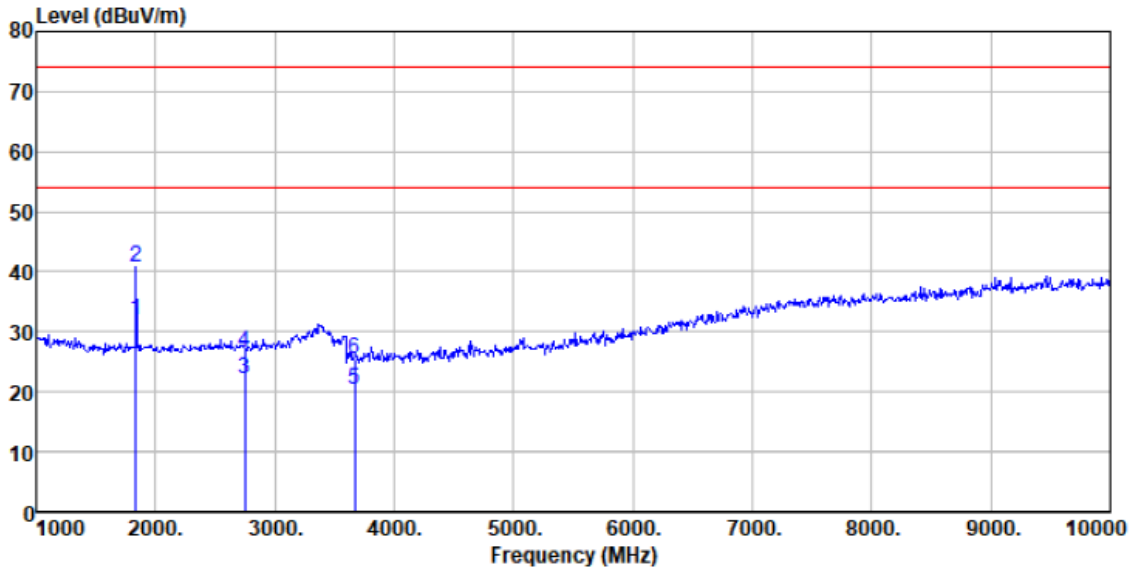



Condition : FCC PART15 CLASS B 3m VERTICAL
EUT : Stage luminaires
Test Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 922.2MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 37.025 | 56.86 | 11.20 | 35.49 | 0.63 | 33.20 | 40.00 | -6.80 | QP |
| 2 | 43.966 | 52.98 | 12.25 | 35.88 | 0.71 | 30.06 | 40.00 | -9.94 | QP |
| 3 | 80.644 | 58.51 | 7.30 | 36.55 | 1.03 | 30.29 | 40.00 | -9.71 | QP |
| 4 | 127.665 | 57.51 | 8.43 | 36.93 | 1.42 | 30.43 | 43.50 | -13.07 | QP |
| 5 | 178.758 | 54.39 | 8.70 | 37.23 | 1.73 | 27.59 | 43.50 | -15.91 | QP |
| 6 | 866.088 | 47.70 | 21.91 | 37.61 | 4.73 | 36.73 | 46.00 | -9.27 | QP |
| 7 * | 922.200 | 98.76 | 22.32 | 37.58 | 4.93 | 88.43 | 46.00 | 42.43 | Average |
| 8 * | 922.200 | 107.88 | 22.32 | 37.58 | 4.93 | 97.55 | 46.00 | 51.55 | Peak |

■ **Above 1GHz**

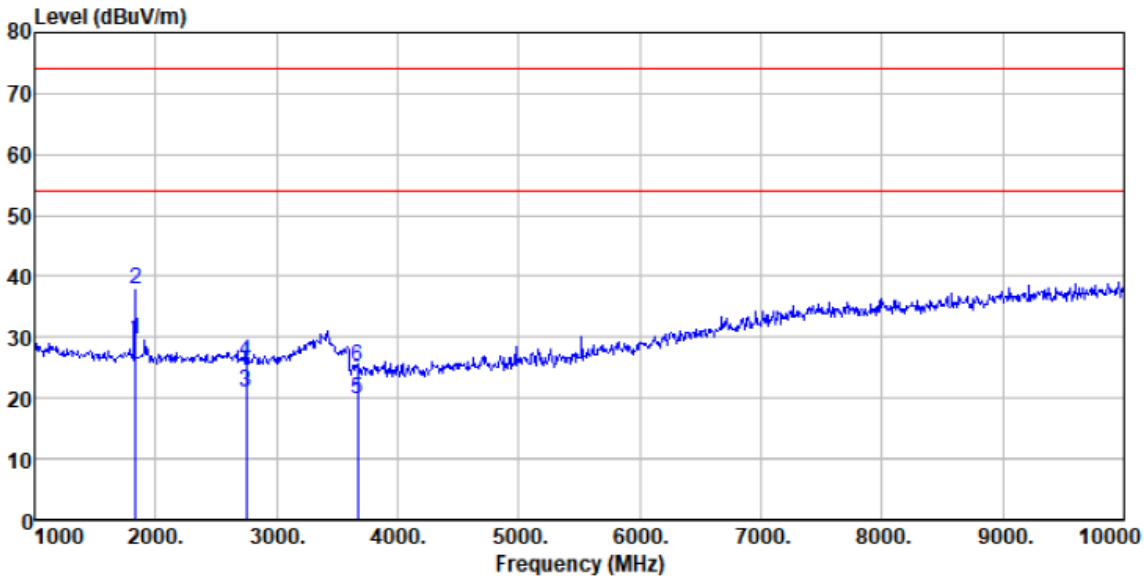
| Antenna Polarity: | Horizontal | Test channel: | Lowest |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m HORIZONTAL
EUT : Stage luminaires
Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 917MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1834.000 | 40.01 | 25.86 | 36.40 | 2.49 | 31.96 | 54.00 | -22.04 | Average |
| 2 | 1834.000 | 48.73 | 25.86 | 36.40 | 2.49 | 40.68 | 74.00 | -33.32 | Peak |
| 3 | 2751.000 | 28.00 | 28.07 | 37.13 | 3.18 | 22.12 | 54.00 | -31.88 | Average |
| 4 | 2751.000 | 32.54 | 28.07 | 37.13 | 3.18 | 26.66 | 74.00 | -47.34 | Peak |
| 5 | 3668.000 | 25.04 | 28.91 | 37.37 | 3.87 | 20.45 | 54.00 | -33.55 | Average |
| 6 | 3668.000 | 30.09 | 28.91 | 37.37 | 3.87 | 25.50 | 74.00 | -48.50 | Peak |

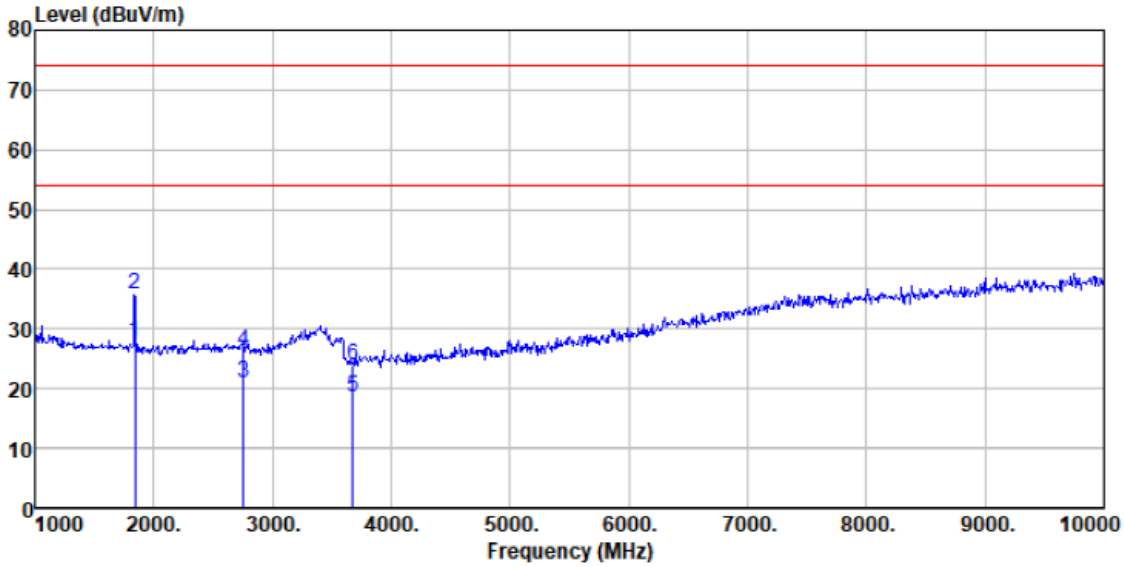
| Antenna Polarity: | Vertical | Test channel: | Lowest |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 917MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1834.000 | 37.67 | 25.86 | 36.40 | 2.49 | 29.62 | 54.00 | -24.38 | Average |
| 2 | 1834.000 | 45.80 | 25.86 | 36.40 | 2.49 | 37.75 | 74.00 | -36.25 | Peak |
| 3 | 2751.000 | 26.89 | 28.07 | 37.13 | 3.18 | 21.01 | 54.00 | -32.99 | Average |
| 4 | 2751.000 | 31.78 | 28.07 | 37.13 | 3.18 | 25.90 | 74.00 | -48.10 | Peak |
| 5 | 3668.000 | 24.39 | 28.91 | 37.37 | 3.87 | 19.80 | 54.00 | -34.20 | Average |
| 6 | 3668.000 | 29.54 | 28.91 | 37.37 | 3.87 | 24.95 | 74.00 | -49.05 | Peak |

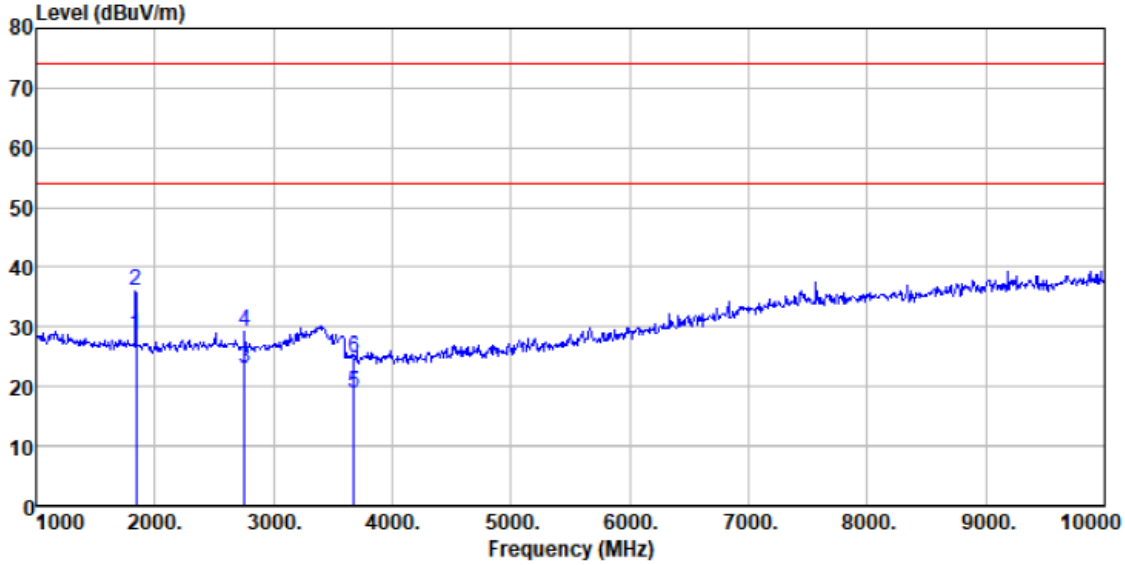
| Antenna Polarity: | Horizontal | Test channel: | Middle |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m HORIZONTAL
EUT : Stage luminaires
Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 919.6MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1839.200 | 35.81 | 25.87 | 36.40 | 2.49 | 27.77 | 54.00 | -26.23 | Average |
| 2 | 1839.200 | 43.62 | 25.87 | 36.40 | 2.49 | 35.58 | 74.00 | -38.42 | Peak |
| 3 | 2758.800 | 26.89 | 28.08 | 37.13 | 3.18 | 21.02 | 54.00 | -32.98 | Average |
| 4 | 2758.800 | 32.25 | 28.08 | 37.13 | 3.18 | 26.38 | 74.00 | -47.62 | Peak |
| 5 | 3678.400 | 23.10 | 28.94 | 37.37 | 3.87 | 18.54 | 54.00 | -35.46 | Average |
| 6 | 3678.400 | 28.49 | 28.94 | 37.37 | 3.87 | 23.93 | 74.00 | -50.07 | Peak |

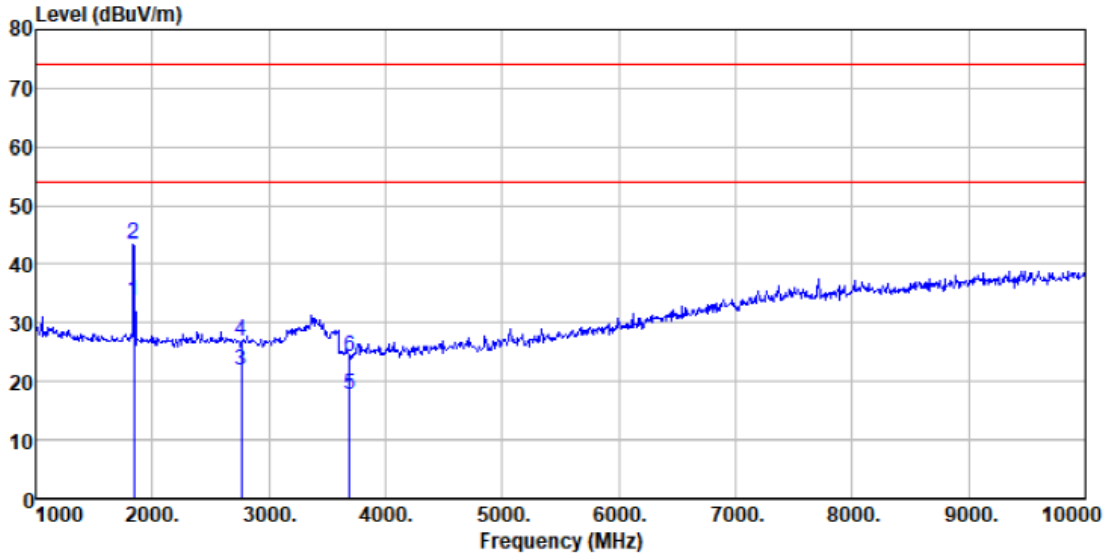
| Antenna Polarity: | Vertical | Test channel: | Middle |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 919.6MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1839.200 | 36.66 | 25.87 | 36.40 | 2.49 | 28.62 | 54.00 | -25.38 | Average |
| 2 | 1839.200 | 44.01 | 25.87 | 36.40 | 2.49 | 35.97 | 74.00 | -38.03 | Peak |
| 3 | 2758.800 | 28.82 | 28.08 | 37.13 | 3.18 | 22.95 | 54.00 | -31.05 | Average |
| 4 | 2758.800 | 35.16 | 28.08 | 37.13 | 3.18 | 29.29 | 74.00 | -44.71 | Peak |
| 5 | 3678.400 | 23.32 | 28.94 | 37.37 | 3.87 | 18.76 | 54.00 | -35.24 | Average |
| 6 | 3678.400 | 29.26 | 28.94 | 37.37 | 3.87 | 24.70 | 74.00 | -49.30 | Peak |

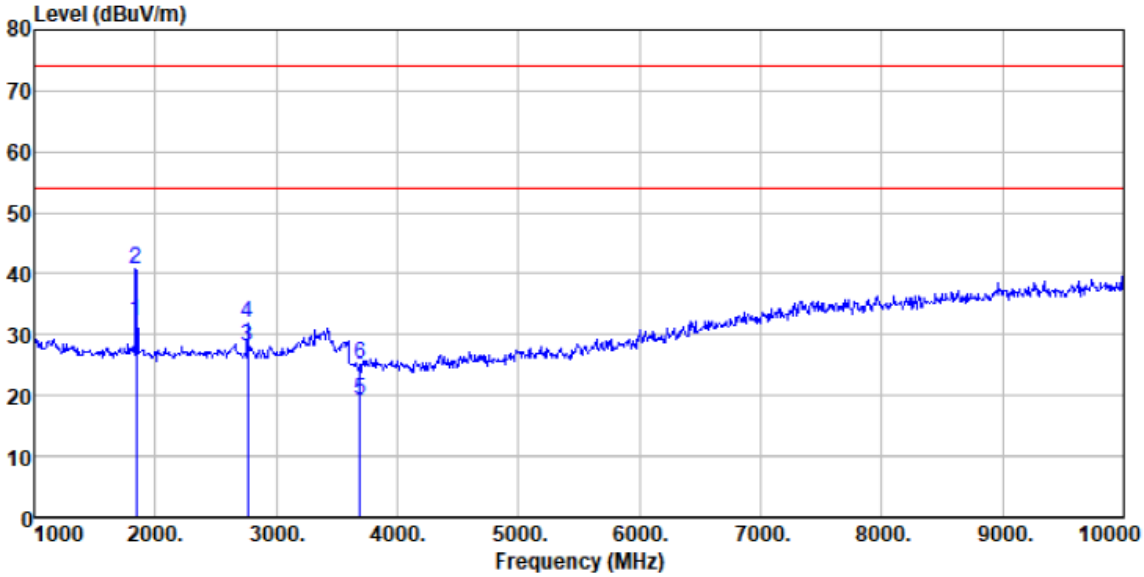
| Antenna Polarity: | Horizontal | Test channel: | Highest |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m HORIZONTAL
EUT : Stage luminaires
Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 922.2MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1844.400 | 41.62 | 25.88 | 36.41 | 2.49 | 33.58 | 54.00 | -20.42 | Average |
| 2 | 1844.400 | 51.53 | 25.88 | 36.41 | 2.49 | 43.49 | 74.00 | -30.51 | Peak |
| 3 | 2766.600 | 27.77 | 28.09 | 37.14 | 3.19 | 21.91 | 54.00 | -32.09 | Average |
| 4 | 2766.600 | 32.78 | 28.09 | 37.14 | 3.19 | 26.92 | 74.00 | -47.08 | Peak |
| 5 | 3688.800 | 22.37 | 28.97 | 37.37 | 3.87 | 17.84 | 54.00 | -36.16 | Average |
| 6 | 3688.800 | 28.73 | 28.97 | 37.37 | 3.87 | 24.20 | 74.00 | -49.80 | Peak |

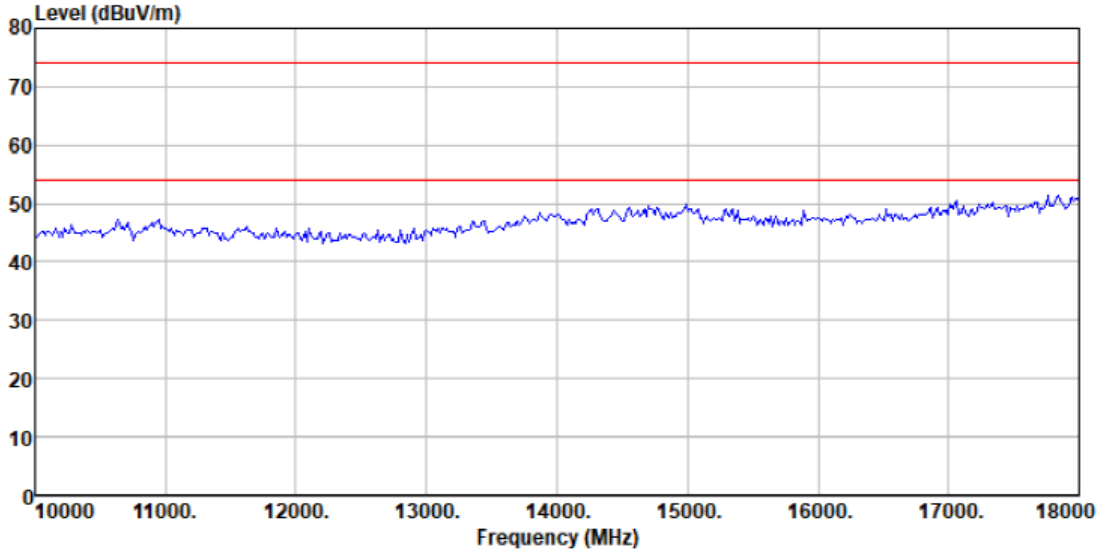
| Antenna Polarity: | Vertical | Test channel: | Highest |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Model : FP1
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 922.2MHz

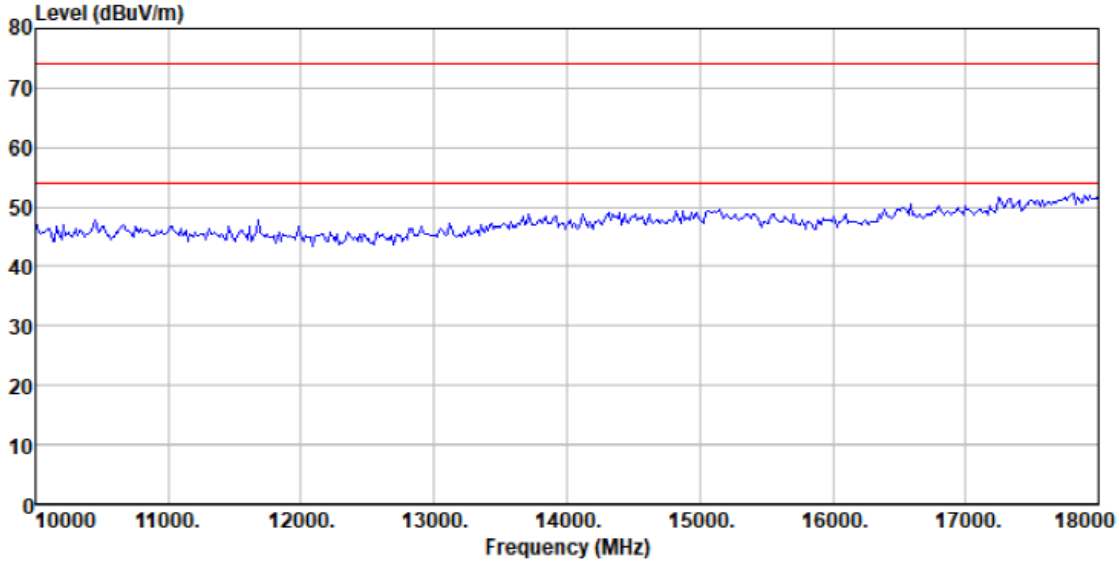
| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1844.400 | 40.36 | 25.88 | 36.41 | 2.49 | 32.32 | 54.00 | -21.68 | Average |
| 2 | 1844.400 | 48.82 | 25.88 | 36.41 | 2.49 | 40.78 | 74.00 | -33.22 | Peak |
| 3 | 2766.600 | 33.88 | 28.09 | 37.14 | 3.19 | 28.02 | 54.00 | -25.98 | Average |
| 4 | 2766.600 | 37.60 | 28.09 | 37.14 | 3.19 | 31.74 | 74.00 | -42.26 | Peak |
| 5 | 3688.800 | 23.76 | 28.97 | 37.37 | 3.87 | 19.23 | 54.00 | -34.77 | Average |
| 6 | 3688.800 | 29.69 | 28.97 | 37.37 | 3.87 | 25.16 | 74.00 | -48.84 | Peak |

| Antenna Polarity: | Horizontal | Test channel: | Lowest |
|---|---|---|---|



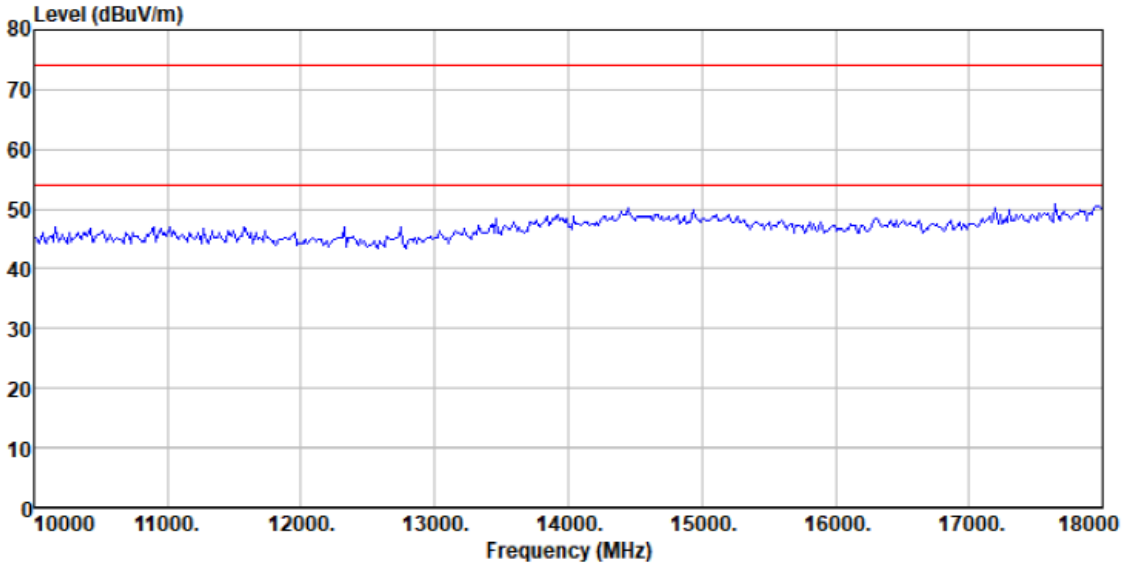

```
Condition     : FCC PART 15 (PK) 3m HORIZONTAL
EUT           : Stage luminaires
Test Mode     : Charging + 920MHz TX mode
Test Engineer: Lee
Model         : FP1
T&H           : 24℃   49%
Test voltage : AC120V 60Hz
CH            : 917MHz
```

| | | | |
|---|---|---|---|
| Antenna Polarity: | Vertical | Test channel: | Lowest |



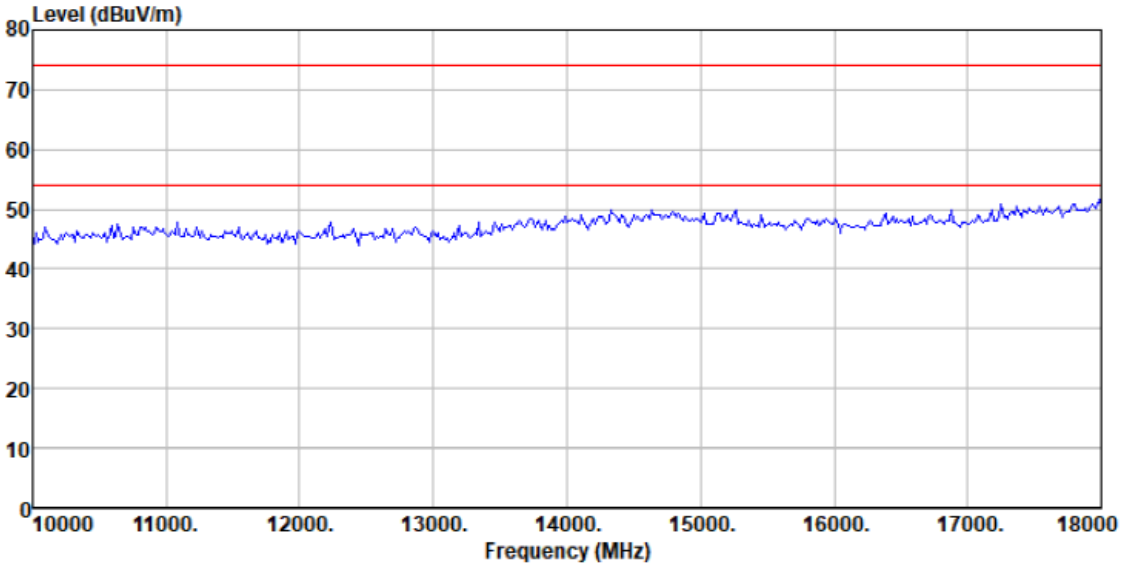

Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Test Mode : Charging + 920MHz TX mode
Test Engineer: Lee
Model : FP1
T&H : 24℃ 49%
Test voltage : AC120V 60Hz
CH : 917MHz

| Antenna Polarity: | Horizontal | Test channel: | Middle |
|---|---|---|---|



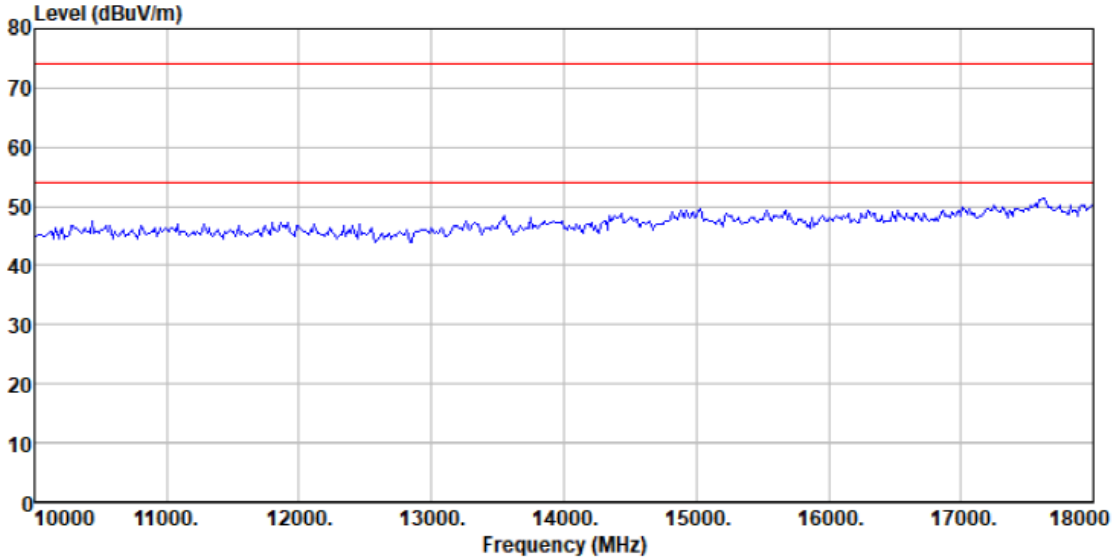

```
Condition     : FCC PART 15 (PK) 3m HORIZONTAL
EUT           : Stage luminaires
Test Mode     : Charging + 920MHz TX mode
Test Engineer: Lee
Model         : FP1
T&H           : 24℃    49%
Test voltage : AC120V 60Hz
CH            : 919.6MHz
```

| | | | |
|---|---|---|---|
| Antenna Polarity: | Vertical | Test channel: | Middle |



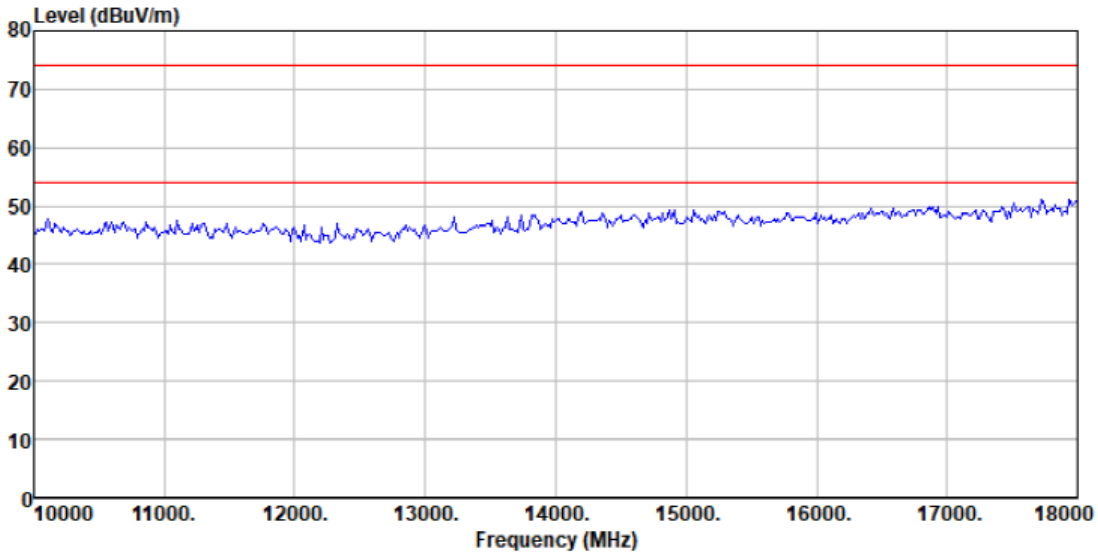

Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Test Mode : Charging + 920MHz TX mode
Test Engineer: Lee
Model : FP1
T&H : 24℃ 49%
Test voltage : AC120V 60Hz
CH : 919.6MHz

| Antenna Polarity: | Horizontal | Test channel: | Highest |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m HORIZONTAL
EUT : Stage luminaires
Test Mode : Charging + 920MHz TX mode
Test Engineer: Lee
Model : FP1
T&H : 24℃ 49%
Test voltage : AC120V 60Hz
CH : 922.2MHz

| Antenna Polarity: | Vertical | Test channel: | Highest |
|---|---|---|---|

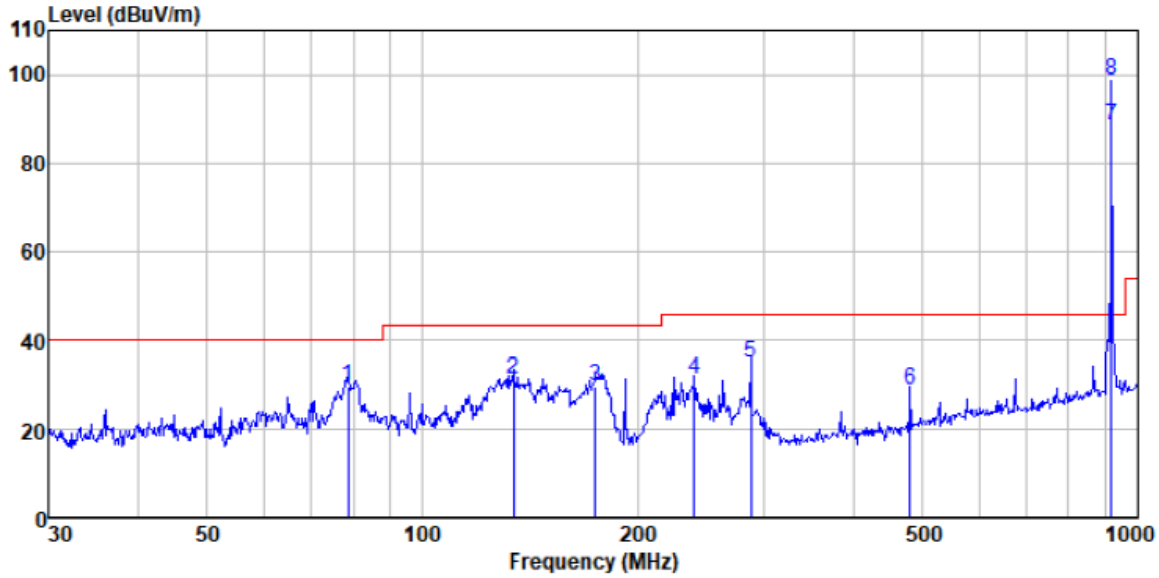



```
Condition     : FCC PART 15 (PK) 3m VERTICAL
EUT           : Stage luminaires
Test Mode     : Charging + 920MHz TX mode
Test Engineer: Lee
Model         : FP1
T&H           : 24℃    49%
Test voltage : AC120V 60Hz
CH            : 922.2MHz
```

**FP2:**

■ **Below 1GHz**

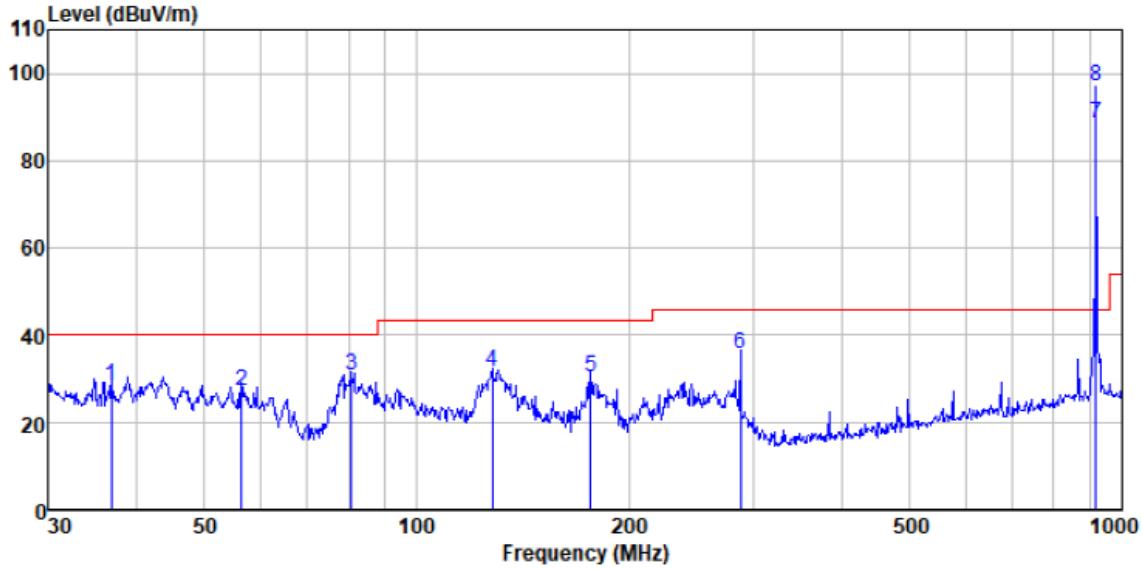
| Antenna Polarity: | Horizontal | Test channel: | Lowest |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m HORIZONTAL
EUT : Stage luminaires
Test Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 917MHz

| | | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | | 78.689 | 57.97 | 7.33 | 36.53 | 1.02 | 29.79 | 40.00 | -10.21 | QP |
| 2 | | 134.088 | 58.82 | 7.83 | 36.98 | 1.47 | 31.14 | 43.50 | -12.36 | QP |
| 3 | | 174.424 | 56.39 | 8.60 | 37.21 | 1.71 | 29.49 | 43.50 | -14.01 | QP |
| 4 | | 239.987 | 54.92 | 11.56 | 37.37 | 2.07 | 31.18 | 46.00 | -14.82 | QP |
| 5 | | 287.990 | 57.04 | 13.11 | 37.41 | 2.31 | 35.05 | 46.00 | -10.95 | QP |
| 6 | | 480.528 | 45.86 | 17.14 | 37.51 | 3.22 | 28.71 | 46.00 | -17.29 | QP |
| 7 | * | 917.000 | 99.01 | 22.31 | 37.58 | 4.91 | 88.65 | 46.00 | 42.65 | Average |
| 8 | * | 917.000 | 108.87 | 22.31 | 37.58 | 4.91 | 98.51 | 46.00 | 52.51 | Peak |

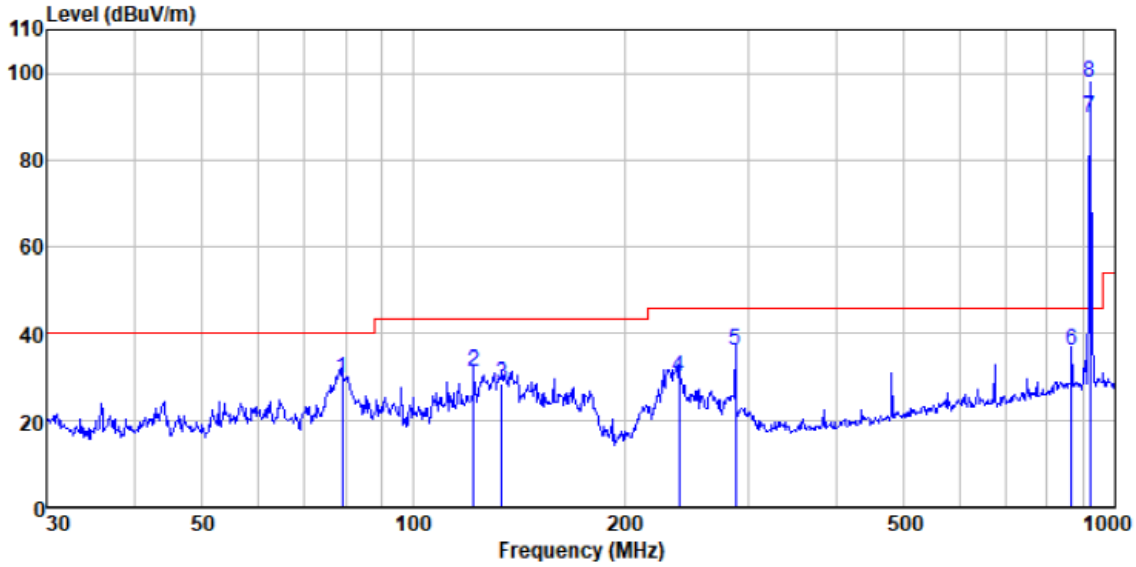
| Antenna Polarity: | Vertical | Test channel: | Lowest |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m VERTICAL
EUT : Stage luminaires
Test Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 917MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 36.895 | 52.11 | 11.20 | 35.48 | 0.63 | 28.46 | 40.00 | -11.54 | QP |
| 2 | 56.395 | 50.87 | 11.67 | 36.27 | 0.83 | 27.10 | 40.00 | -12.90 | QP |
| 3 | 80.927 | 58.93 | 7.30 | 36.56 | 1.04 | 30.71 | 40.00 | -9.29 | QP |
| 4 | 128.113 | 58.69 | 8.43 | 36.94 | 1.42 | 31.60 | 43.50 | -11.90 | QP |
| 5 | 176.269 | 57.54 | 8.60 | 37.22 | 1.72 | 30.64 | 43.50 | -12.86 | QP |
| 6 | 287.990 | 57.52 | 13.11 | 37.41 | 2.31 | 35.53 | 46.00 | -10.47 | QP |
| 7 * | 917.000 | 98.73 | 22.31 | 37.58 | 4.91 | 88.37 | 46.00 | 42.37 | Average |
| 8 * | 917.000 | 107.51 | 22.31 | 37.58 | 4.91 | 97.15 | 46.00 | 51.15 | Peak |

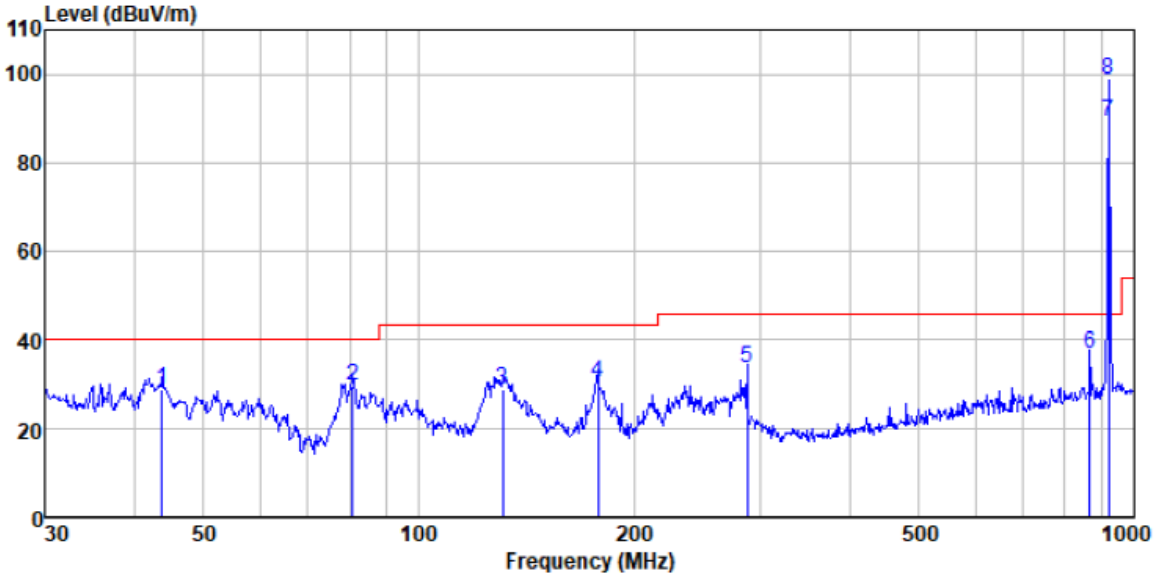
| Antenna Polarity: | Horizontal | Test channel: | Middle |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m HORIZONTAL
EUT : Stage luminaires
Test Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 919.6MHz

| | Freq | ReadLevel | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 79.243 | 57.88 | 7.30 | 36.54 | 1.02 | 29.66 | 40.00 | -10.34 | QP |
| 2 | 121.976 | 57.72 | 9.07 | 36.89 | 1.38 | 31.28 | 43.50 | -12.22 | QP |
| 3 | 133.619 | 56.09 | 7.83 | 36.98 | 1.46 | 28.40 | 43.50 | -15.10 | QP |
| 4 | 239.147 | 53.83 | 11.46 | 37.37 | 2.06 | 29.98 | 46.00 | -16.02 | QP |
| 5 | 287.990 | 58.26 | 13.11 | 37.41 | 2.31 | 36.27 | 46.00 | -9.73 | QP |
| 6 | 866.088 | 46.92 | 21.91 | 37.61 | 4.73 | 35.95 | 46.00 | -10.05 | QP |
| 7 * | 919.600 | 99.90 | 22.32 | 37.58 | 4.93 | 89.57 | 46.00 | 43.57 | Average |
| 8 * | 919.600 | 108.15 | 22.32 | 37.58 | 4.93 | 97.82 | 46.00 | 51.82 | Peak |

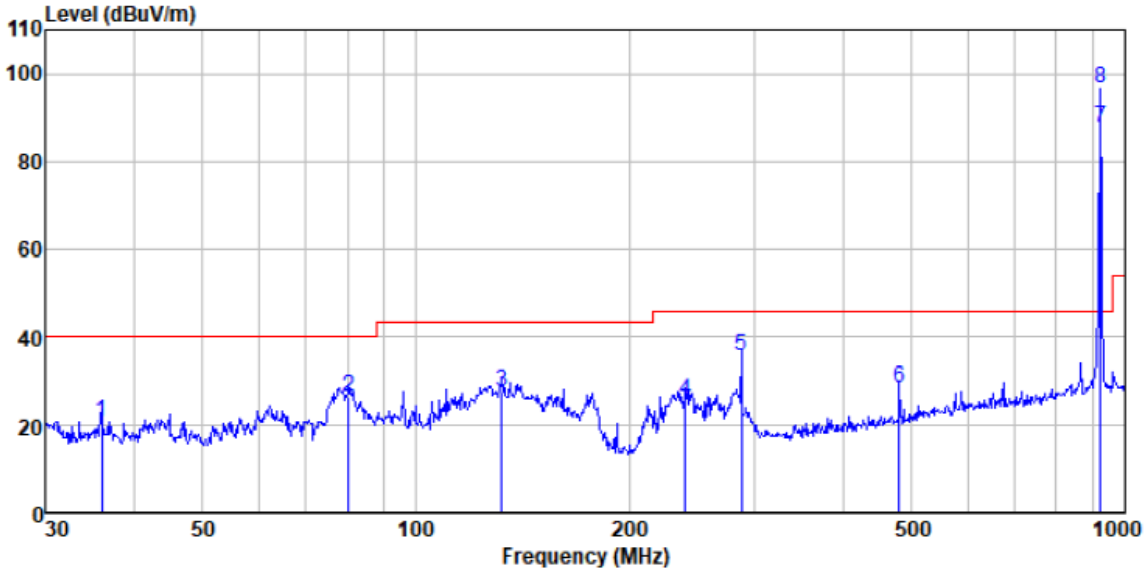
| Antenna Polarity: | Vertical | Test channel: | Middle |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m VERTICAL
EUT : Stage luminaires
Test Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 919.6MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 43.812 | 51.72 | 12.25 | 35.87 | 0.71 | 28.81 | 40.00 | -11.19 | QP |
| 2 | 80.927 | 57.81 | 7.30 | 36.56 | 1.04 | 29.59 | 40.00 | -10.41 | QP |
| 3 | 130.837 | 56.22 | 8.10 | 36.96 | 1.44 | 28.80 | 43.50 | -14.70 | QP |
| 4 | 178.133 | 57.15 | 8.70 | 37.23 | 1.73 | 30.35 | 43.50 | -13.15 | QP |
| 5 | 287.990 | 55.56 | 13.11 | 37.41 | 2.31 | 33.57 | 46.00 | -12.43 | QP |
| 6 | 866.088 | 47.86 | 21.91 | 37.61 | 4.73 | 36.89 | 46.00 | -9.11 | QP |
| 7 * | 919.600 | 99.46 | 22.32 | 37.58 | 4.93 | 89.13 | 46.00 | 43.13 | Average |
| 8 * | 919.600 | 108.79 | 22.32 | 37.58 | 4.93 | 98.46 | 46.00 | 52.46 | Peak |

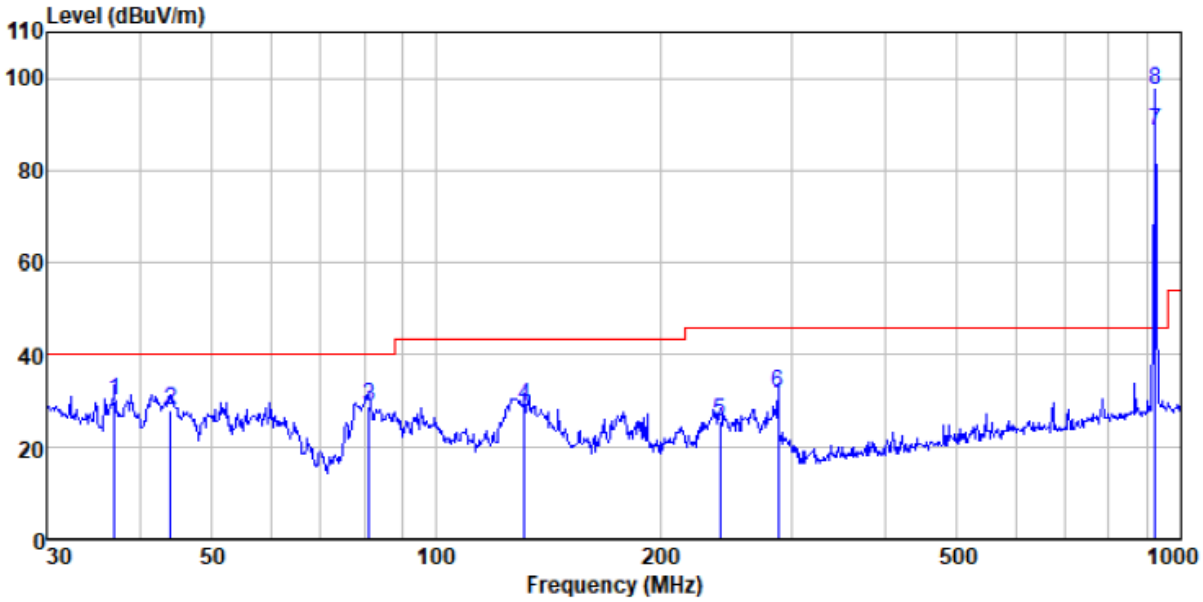
| Antenna Polarity: | Horizontal | Test channel: | Highest |
|---|---|---|---|




Condition : FCC PART15 CLASS B 3m HORIZONTAL
EUT : Stage luminaires
Test Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 922.2MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 36.001 | 44.34 | 11.20 | 35.42 | 0.62 | 20.74 | 40.00 | -19.26 | QP |
| 2 | 80.362 | 54.54 | 7.30 | 36.55 | 1.03 | 26.32 | 40.00 | -13.68 | QP |
| 3 | 132.221 | 54.97 | 8.10 | 36.97 | 1.45 | 27.55 | 43.50 | -15.95 | QP |
| 4 | 239.987 | 49.26 | 11.56 | 37.37 | 2.07 | 25.52 | 46.00 | -20.48 | QP |
| 5 | 287.990 | 57.90 | 13.11 | 37.41 | 2.31 | 35.91 | 46.00 | -10.09 | QP |
| 6 | 480.528 | 45.76 | 17.14 | 37.51 | 3.22 | 28.61 | 46.00 | -17.39 | QP |
| 7 * | 922.200 | 98.14 | 22.32 | 37.58 | 4.93 | 87.81 | 46.00 | 41.81 | Average |
| 8 * | 922.200 | 106.88 | 22.32 | 37.58 | 4.93 | 96.55 | 46.00 | 50.55 | Peak |

| Antenna Polarity: | Vertical | Test channel: | Highest |
|---|---|---|---|

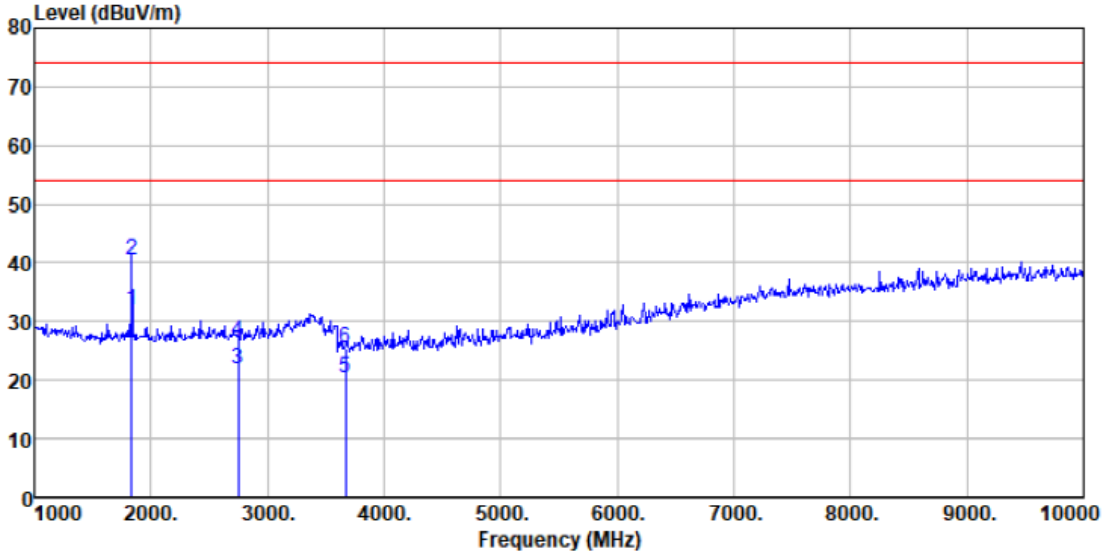



Condition : FCC PART15 CLASS B 3m VERTICAL
EUT : Stage luminaires
Test Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 922.2MHz

| | | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | | 37.025 | 53.86 | 11.20 | 35.49 | 0.63 | 30.20 | 40.00 | -9.80 | QP |
| 2 | | 43.966 | 50.98 | 12.25 | 35.88 | 0.71 | 28.06 | 40.00 | -11.94 | QP |
| 3 | | 81.212 | 57.01 | 7.30 | 36.56 | 1.04 | 28.79 | 40.00 | -11.21 | QP |
| 4 | | 131.297 | 56.22 | 8.10 | 36.96 | 1.44 | 28.80 | 43.50 | -14.70 | QP |
| 5 | | 240.830 | 49.20 | 11.56 | 37.37 | 2.08 | 25.47 | 46.00 | -20.53 | QP |
| 6 | | 287.990 | 53.71 | 13.11 | 37.41 | 2.31 | 31.72 | 46.00 | -14.28 | QP |
| 7 | * | 922.200 | 98.66 | 22.32 | 37.58 | 4.93 | 88.33 | 46.00 | 42.33 | Average |
| 8 | * | 922.200 | 107.77 | 22.32 | 37.58 | 4.93 | 97.44 | 46.00 | 51.44 | Peak |

■ **Above 1GHz**

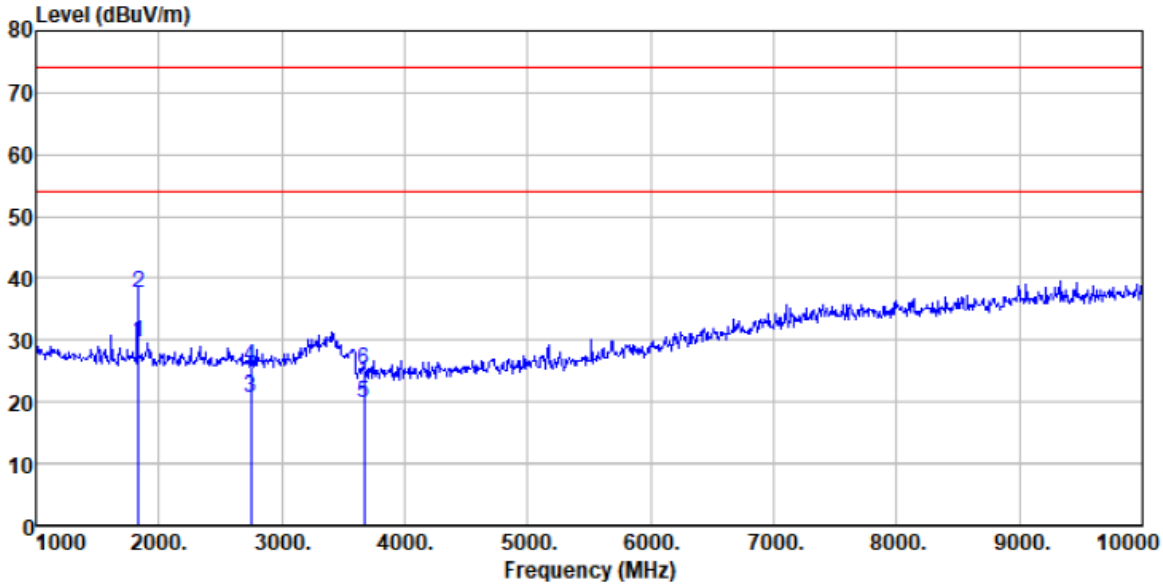
| Antenna Polarity: | Horizontal | Test channel: | Lowest |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m HORIZONTAL
EUT : Stage luminaires
Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 917MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1834.000 | 40.01 | 25.86 | 36.40 | 2.49 | 31.96 | 54.00 | -22.04 | Average |
| 2 | 1834.000 | 48.53 | 25.86 | 36.40 | 2.49 | 40.48 | 74.00 | -33.52 | Peak |
| 3 | 2751.000 | 27.60 | 28.07 | 37.13 | 3.18 | 21.72 | 54.00 | -32.28 | Average |
| 4 | 2751.000 | 32.56 | 28.07 | 37.13 | 3.18 | 26.68 | 74.00 | -47.32 | Peak |
| 5 | 3668.000 | 25.01 | 28.91 | 37.37 | 3.87 | 20.42 | 54.00 | -33.58 | Average |
| 6 | 3668.000 | 30.12 | 28.91 | 37.37 | 3.87 | 25.53 | 74.00 | -48.47 | Peak |

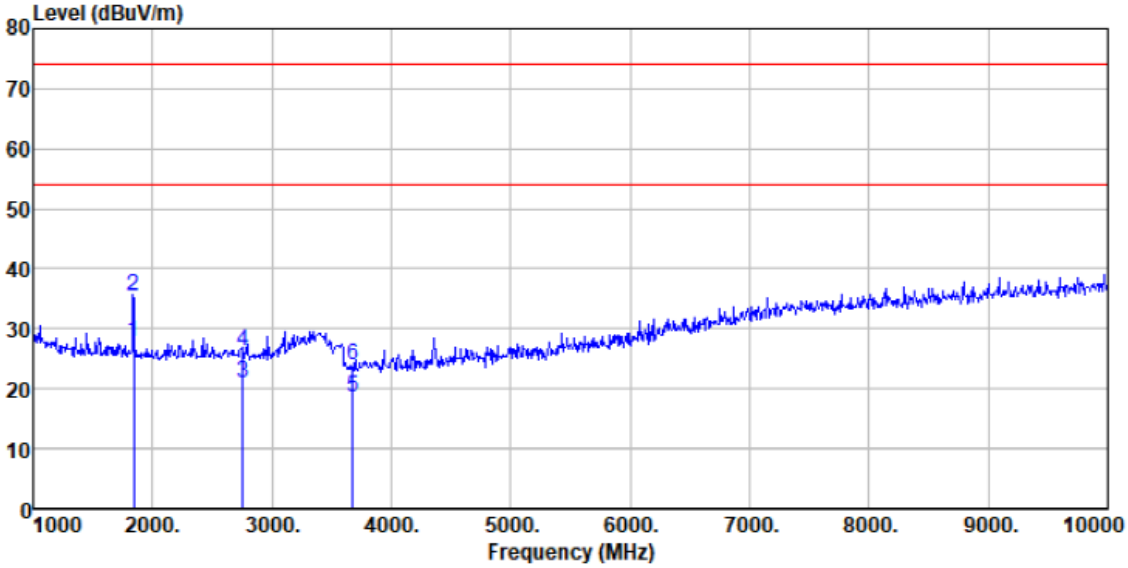
| Antenna Polarity: | Vertical | Test channel: | Lowest |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 917MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1834.000 | 37.69 | 25.86 | 36.40 | 2.49 | 29.64 | 54.00 | -24.36 | Average |
| 2 | 1834.000 | 45.50 | 25.86 | 36.40 | 2.49 | 37.45 | 74.00 | -36.55 | Peak |
| 3 | 2751.000 | 26.59 | 28.07 | 37.13 | 3.18 | 20.71 | 54.00 | -33.29 | Average |
| 4 | 2751.000 | 31.68 | 28.07 | 37.13 | 3.18 | 25.80 | 74.00 | -48.20 | Peak |
| 5 | 3668.000 | 24.23 | 28.91 | 37.37 | 3.87 | 19.64 | 54.00 | -34.36 | Average |
| 6 | 3668.000 | 29.64 | 28.91 | 37.37 | 3.87 | 25.05 | 74.00 | -48.95 | Peak |

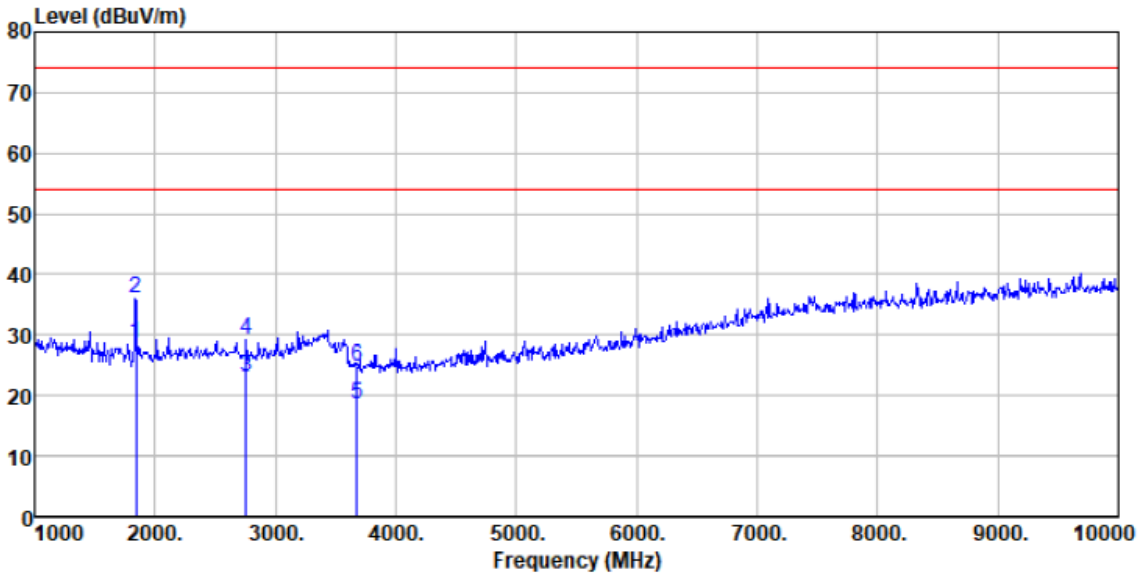
| Antenna Polarity: | Horizontal | Test channel: | Middle |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m HORIZONTAL
EUT : Stage luminaires
Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 919.6MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1839.200 | 35.71 | 25.87 | 36.40 | 2.49 | 27.67 | 54.00 | -26.33 | Average |
| 2 | 1839.200 | 43.55 | 25.87 | 36.40 | 2.49 | 35.51 | 74.00 | -38.49 | Peak |
| 3 | 2758.800 | 26.69 | 28.08 | 37.13 | 3.18 | 20.82 | 54.00 | -33.18 | Average |
| 4 | 2758.800 | 32.22 | 28.08 | 37.13 | 3.18 | 26.35 | 74.00 | -47.65 | Peak |
| 5 | 3678.400 | 23.11 | 28.94 | 37.37 | 3.87 | 18.55 | 54.00 | -35.45 | Average |
| 6 | 3678.400 | 28.44 | 28.94 | 37.37 | 3.87 | 23.88 | 74.00 | -50.12 | Peak |

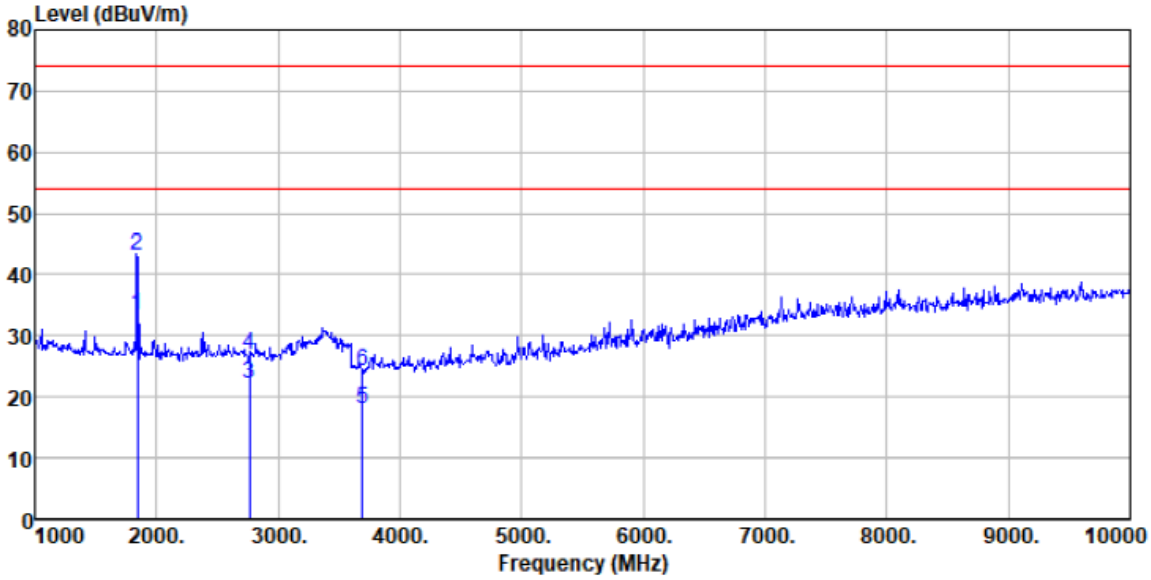
| Antenna Polarity: | Vertical | Test channel: | Middle |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 919.6MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1839.200 | 36.55 | 25.87 | 36.40 | 2.49 | 28.51 | 54.00 | -25.49 | Average |
| 2 | 1839.200 | 44.00 | 25.87 | 36.40 | 2.49 | 35.96 | 74.00 | -38.04 | Peak |
| 3 | 2758.800 | 28.78 | 28.08 | 37.13 | 3.18 | 22.91 | 54.00 | -31.09 | Average |
| 4 | 2758.800 | 35.12 | 28.08 | 37.13 | 3.18 | 29.25 | 74.00 | -44.75 | Peak |
| 5 | 3678.400 | 23.30 | 28.94 | 37.37 | 3.87 | 18.74 | 54.00 | -35.26 | Average |
| 6 | 3678.400 | 29.28 | 28.94 | 37.37 | 3.87 | 24.72 | 74.00 | -49.28 | Peak |

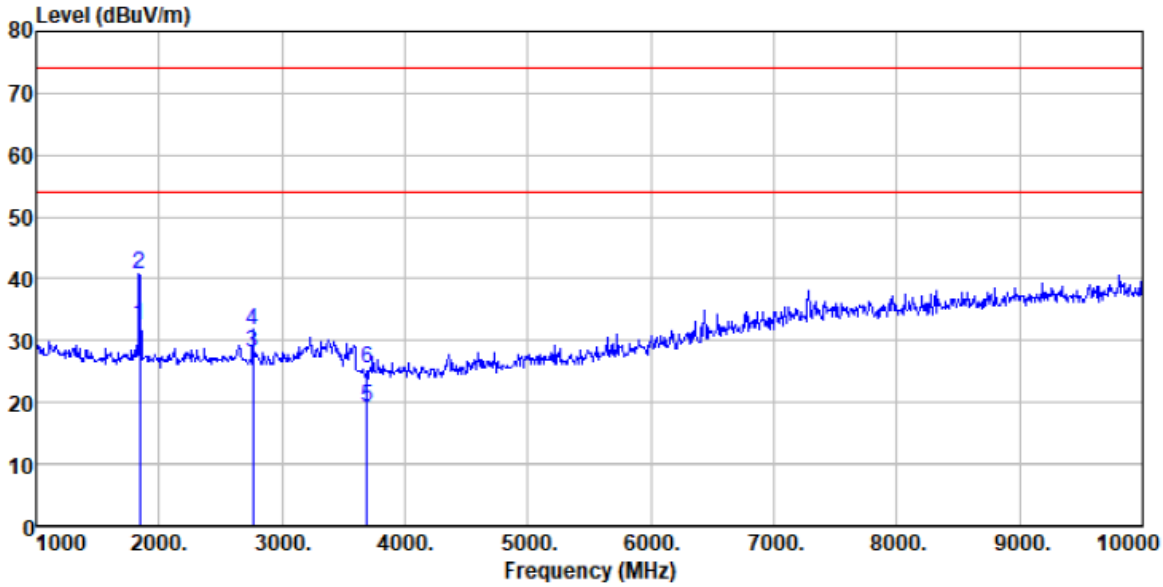
| Antenna Polarity: | Horizontal | Test channel: | Highest |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m HORIZONTAL
EUT : Stage luminaires
Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 922.2MHz

| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1844.400 | 41.34 | 25.88 | 36.41 | 2.49 | 33.30 | 54.00 | -20.70 | Average |
| 2 | 1844.400 | 51.26 | 25.88 | 36.41 | 2.49 | 43.22 | 74.00 | -30.78 | Peak |
| 3 | 2766.600 | 27.88 | 28.09 | 37.14 | 3.19 | 22.02 | 54.00 | -31.98 | Average |
| 4 | 2766.600 | 32.76 | 28.09 | 37.14 | 3.19 | 26.90 | 74.00 | -47.10 | Peak |
| 5 | 3688.800 | 22.43 | 28.97 | 37.37 | 3.87 | 17.90 | 54.00 | -36.10 | Average |
| 6 | 3688.800 | 28.87 | 28.97 | 37.37 | 3.87 | 24.34 | 74.00 | -49.66 | Peak |

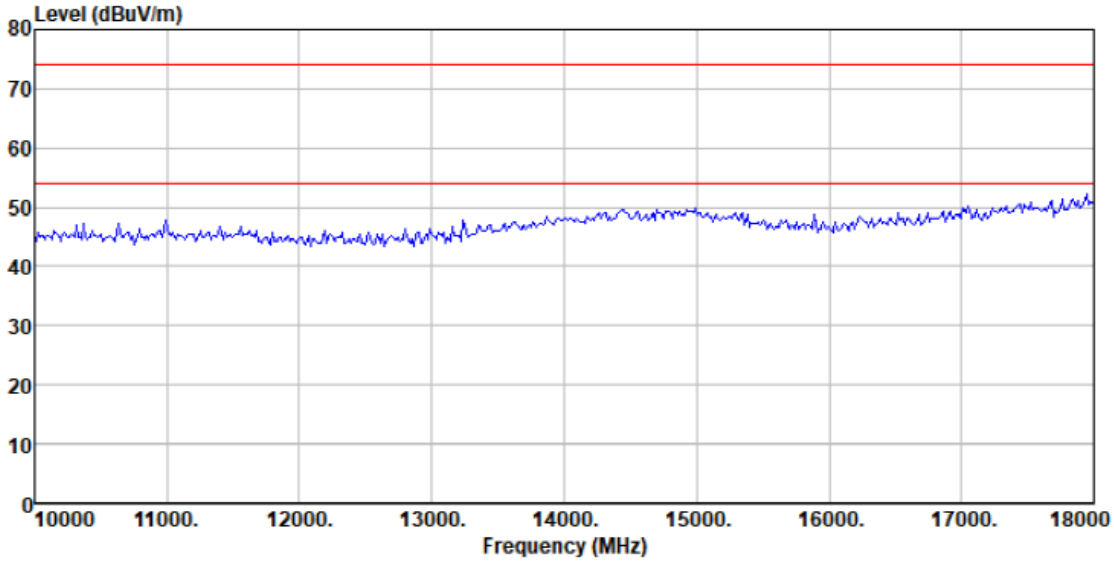
| Antenna Polarity: | Vertical | Test channel: | Highest |
|---|---|---|---|




Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Model : FP2
Test Mode : TX Mode
T&H : 25℃ 48%
Test Engineer: Bourne
Test Voltage : 120V/60Hz
CH : 922.2MHz

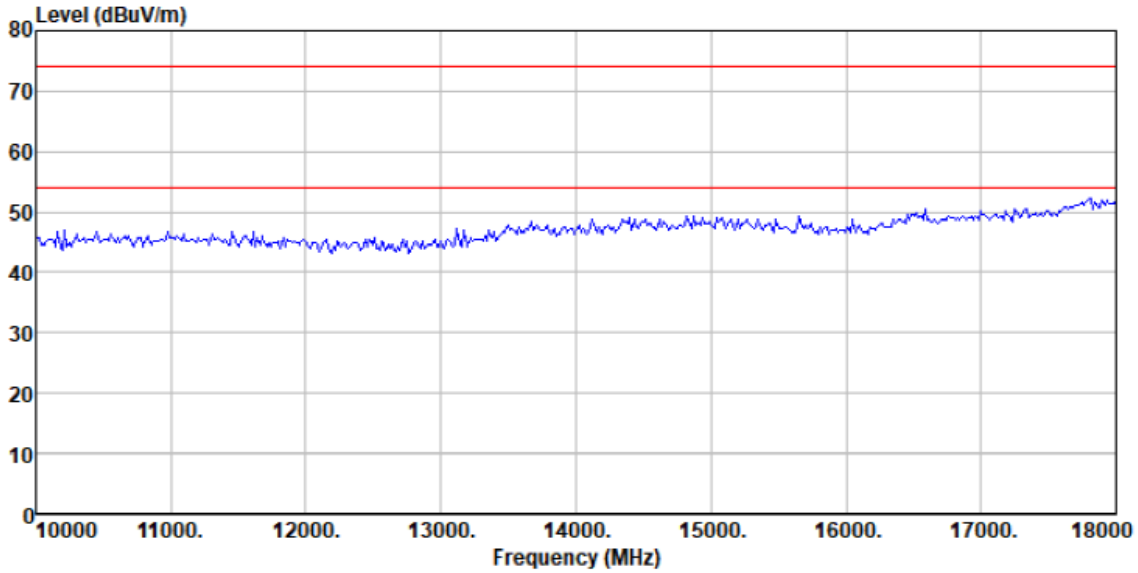
| | Freq | Read Level | Antenna Factor | Preamp Factor | Cable Loss | Level | Limit Line | Over Limit | Remark |
|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBuV | dB/m | dB | dB | dBuV/m | dBuV/m | dB | |
| 1 | 1844.400 | 40.44 | 25.88 | 36.41 | 2.49 | 32.40 | 54.00 | -21.60 | Average |
| 2 | 1844.400 | 48.86 | 25.88 | 36.41 | 2.49 | 40.82 | 74.00 | -33.18 | Peak |
| 3 | 2766.600 | 33.84 | 28.09 | 37.14 | 3.19 | 27.98 | 54.00 | -26.02 | Average |
| 4 | 2766.600 | 37.53 | 28.09 | 37.14 | 3.19 | 31.67 | 74.00 | -42.33 | Peak |
| 5 | 3688.800 | 23.78 | 28.97 | 37.37 | 3.87 | 19.25 | 54.00 | -34.75 | Average |
| 6 | 3688.800 | 29.79 | 28.97 | 37.37 | 3.87 | 25.26 | 74.00 | -48.74 | Peak |

| Antenna Polarity: | Horizontal | Test channel: | Lowest |
|---|---|---|---|



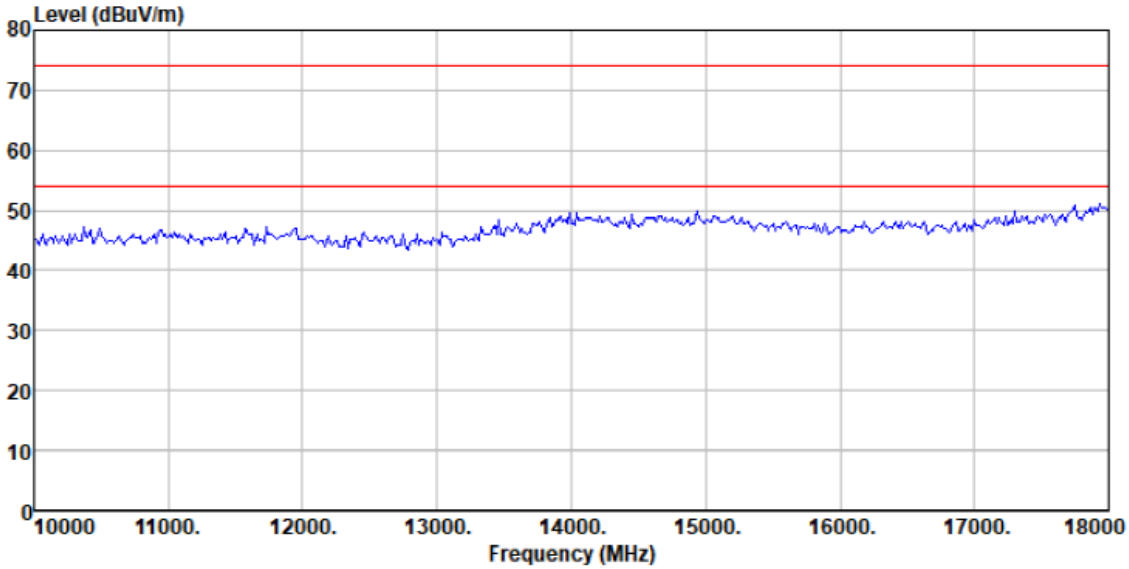

Condition : FCC PART 15 (PK) 3m HORIZONTAL
EUT : Stage luminaires
Test Mode : Charging + 920MHz TX mode
Test Engineer: Lee
Model : FP2
T&H : 24℃ 49%
Test voltage : AC120V 60Hz
CH : 917MHz

| | | | |
|---|---|---|---|
| Antenna Polarity: | Vertical | Test channel: | Lowest |



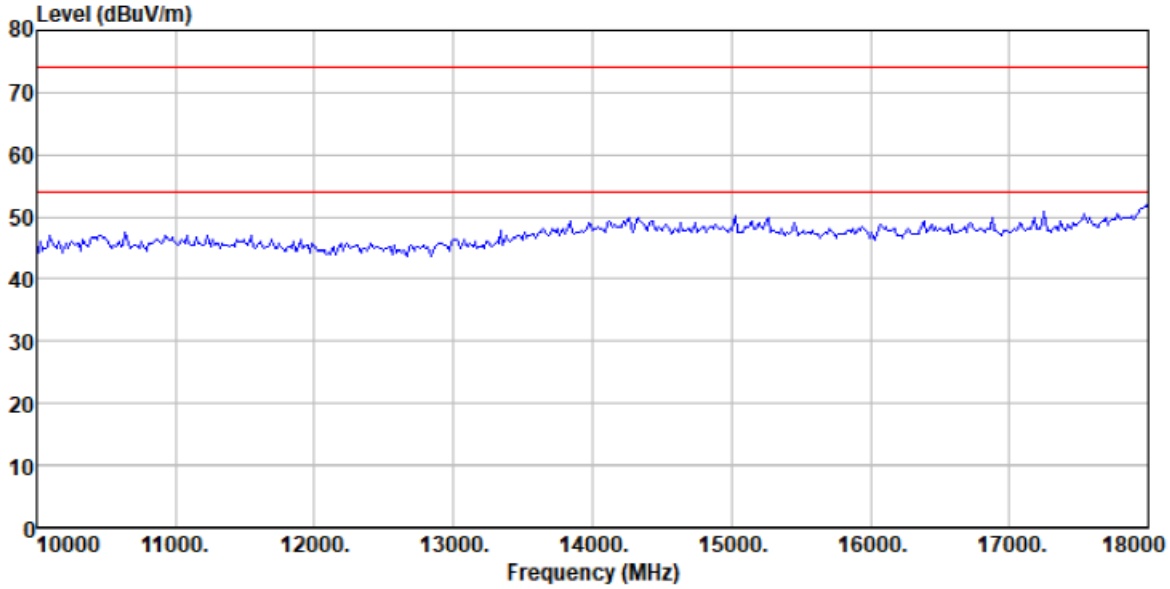

```
Condition     : FCC PART 15 (PK) 3m VERTICAL
EUT           : Stage luminaires
Test Mode     : Charging + 920MHz TX mode
Test Engineer: Lee
Model         : FP2
T&H           : 24℃    49%
Test voltage : AC120V 60Hz
CH            : 917MHz
```

| Antenna Polarity: | Horizontal | Test channel: | Middle |
|---|---|---|---|



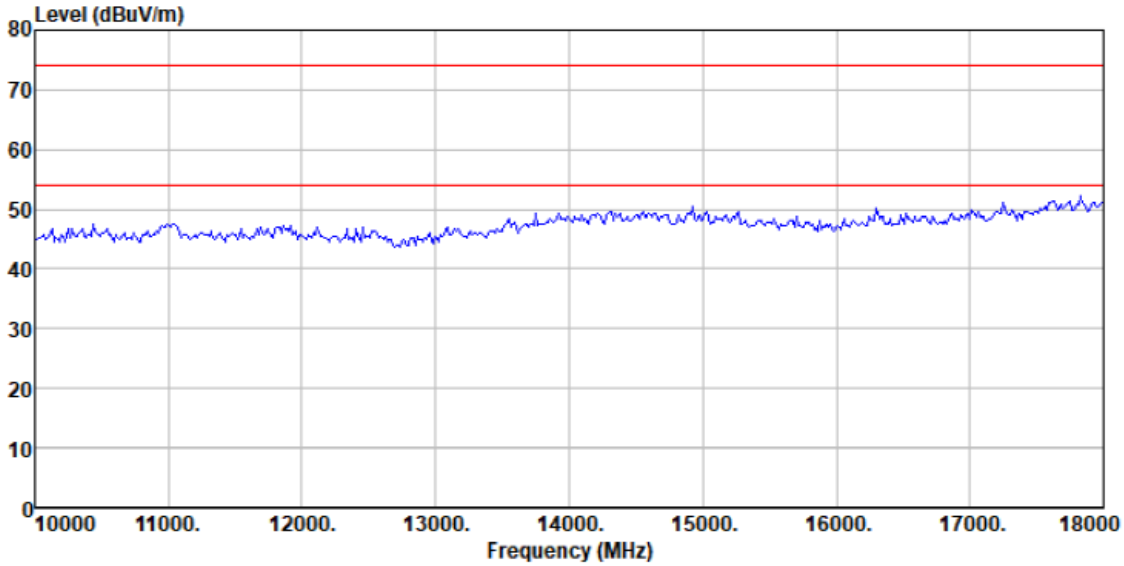

Condition : FCC PART 15 (PK) 3m HORIZONTAL
EUT : Stage luminaires
Test Mode : Charging + 920MHz TX mode
Test Engineer: Lee
Model : FP2
T&H : 24℃ 49%
Test voltage : AC120V 60Hz
CH : 919.6MHz

| Antenna Polarity: | Vertical | Test channel: | Middle |
|---|---|---|---|



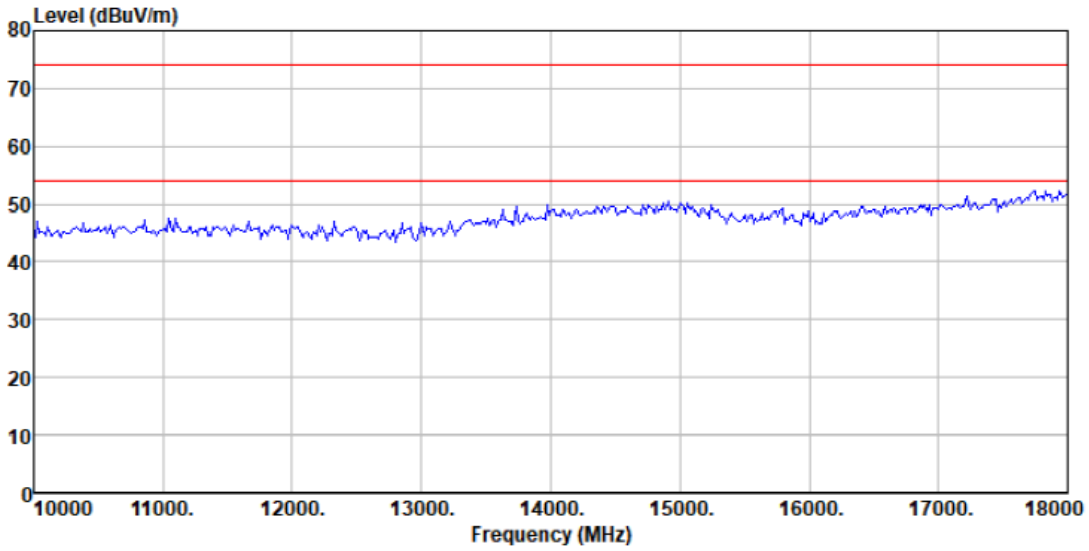

Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Test Mode : Charging + 920MHz TX mode
Test Engineer: Lee
Model : FP2
T&H : 24℃ 49%
Test voltage : AC120V 60Hz
CH : 919.6MHz

| Antenna Polarity: | Horizontal | Test channel: | Highest |
|---|---|---|---|




```
Condition     : FCC PART 15 (PK) 3m HORIZONTAL
EUT           : Stage luminaires
Test Mode     : Charging + 920MHz TX mode
Test Engineer: Lee
Model         : FP2
T&H           : 24℃    49%
Test voltage : AC120V 60Hz
CH            : 922.2MHz
```

| Antenna Polarity: | Vertical | Test channel: | Highest |
|---|---|---|---|



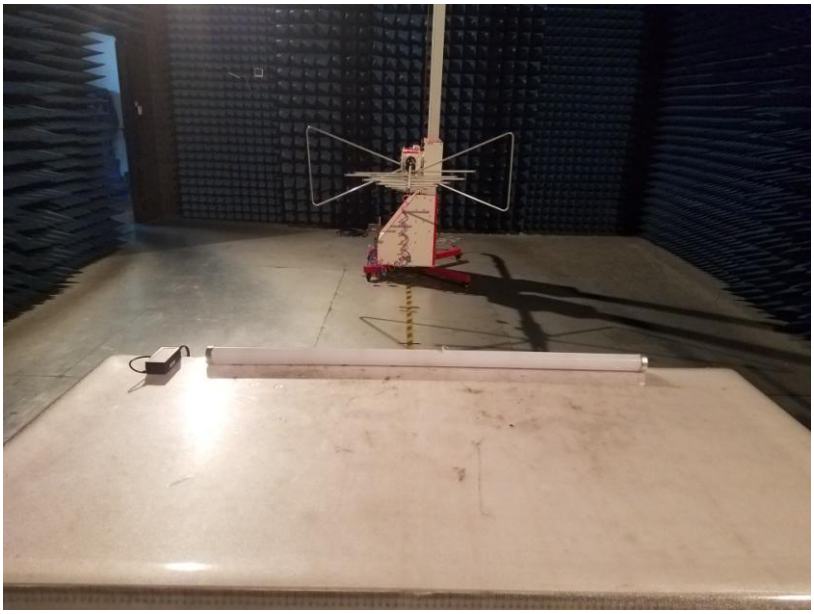

Condition : FCC PART 15 (PK) 3m VERTICAL
EUT : Stage luminaires
Test Mode : Charging + 920MHz TX mode
Test Engineer: Lee
Model : FP2
T&H : 24℃ 49%
Test voltage : AC120V 60Hz
CH : 922.2MHz

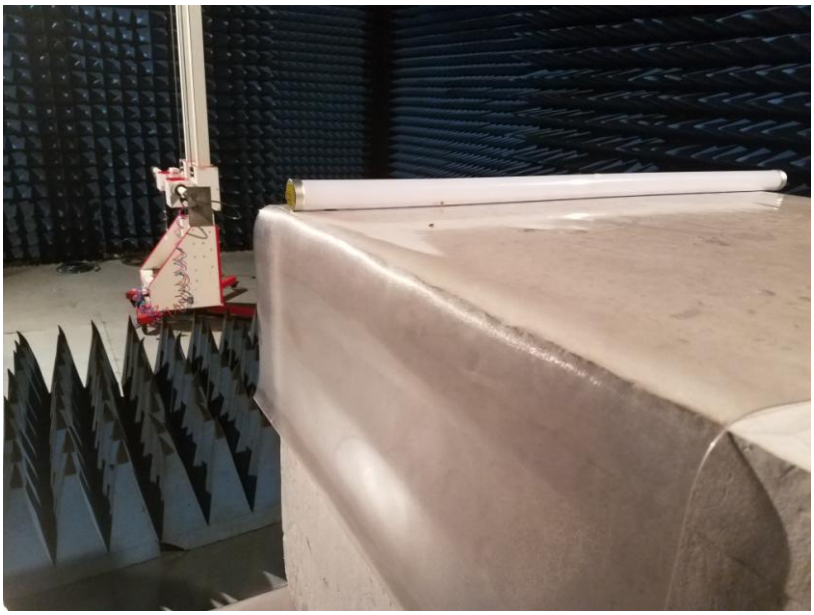
*Remarks:*

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
3. *There are measurements in 18~25GHz, but they are not recorded in the report due to only the bottom noise*

# 8 Test Setup Photo

Radiated Emission





Conducted Emission

# 9 EUT Constructional Details

Reference to External picture and Internal picture for details.

------End------